NEW, COMPLETE AND
UNIVERSAL

# NATURAL HISTORY,

OF ALL
THE MOST REMARKABLE
**Quadrupeds, Birds, Fishes, Reptiles, and Insects,**
IN THE KNOWN WORLD:
ILLUSTRATIVE
Of their Natures, Manners, Dispositions, Habits, &c.

FROM THE LAST LONDON EDITION OF
J. MACLOC, Esq.
*Much improved and enlarged in the descriptions, and by the introduction of a great number of animals which were not in the London edition: particularly,*
AN ACCOUNT OF THE
**Great Sea Serpent, or the Scoliophis Atlanticus:**
Which was seen in the Harbour of Gloucester, Massachusetts.
EMBELLISHED
WITH FIFTY SEVEN ELEGANT COPPERPLATE ENGRAVINGS:
*All executed in a Masterly Style, and*
Representing near Four Hundred Animals.

BY BENJAMIN MAYO.

VOL. II.

PHILADELPHIA:
PRINTED AND PUBLISHED BY M'CARTY & DAVIS,
*S. E. corner of Race and Ninth streets.*
1818.

SMITHSONIAN INSTITUTION
AUG 1 - 1932
291523
NATIONAL MUSEUM

DISTRICT OF PENNSYLVANIA, to wit:

Be it Remembered, That on the twentieth day of February, in the forty-second year of the Independence of the United States of America, A. D. 1818, Jonathan Pounder, of the said district, hath deposited in this office the title of a book, the right whereof he claims as proprietor, in the words following, to wit:

"New complete and universal Natural History, of all the most re-
"markable Quadrupeds, Birds, Fishes, Reptiles, and Insects in the
"known world: illustrative of their Natures, Manners, Dispositions,
"Habits, &c. From the last London edition, of J. Macloc, Esq. much
"improved, and enlarged in the descriptions; and by the introduction
"of a great number of animals, which were not in the London edi-
"tion: particularly, an account of the Great Sea Serpent, or the Scolio-
"phis Atlanticus, which was seen in the Harbour of Gloucester,
"Massachusetts. Embellished with fifty-seven elegant Copperplate
"engravings, all executed in a masterly style, and representing near
"four hundred animals, by Benjamin Mayo."

In conformity to the act of the Congress of the United States, entituled, "An act for the encouragement of learning, by securing the copies of maps, charts and books, to the authors and proprietors of such copies, during the times therein mentioned." And also to the act, entitled, "An Act supplementary to an act, entitled, An Act for the encouragement of learning, by securing the copies of maps, charts and books to the authors and proprietors of such copies, during the times therein mentioned, and extending the benefits thereof to the arts of designing, engraving, and etching historical and other prints.

D. CALDWELL,
Clerk of the District of Pennsylvania.

QL
50
M19
1818
v. 2
SCNHRB

# OF BIRDS.

BEFORE we begin to treat of the different kinds of irds, it may not be deemed improper to make a few eneral observations on this grand department of ani-nated being.

It is a circumstance calculated to excite our highest dmiration, to observe how every order of animals is fitted for its peculiar situation in life, from man down to the meanest reptile: but none more strikingly so than birds. And though we may consider them as falling below beasts in the grade of being, in point of general utility, yet they will undoubtedly be allowed to hold the next rank; being far superior to fishes, reptiles, and insects, in the structure of their bodies, and in comparative sagacity.

The body of man presents the greatest variety: beasts less perfectly formed, show their defects in the simplicity of their conformation: the mechanism of birds is yet less complex: fishes are furnished with fewer organs still; while insects, more imperfect than all, seem to fill up the chasm between animal and vegetable nature. Of man, there are but three or four species; the kinds of beasts are more numerous; birds are more various still; fishes yet more; but insects afford an immense variety.

The form of the bird is nicely adapted to the habits which it is destined to assume; its head is small, for the more readily cleaving the air in flying: their eyes also are pecliarly constructed, being well defended from injuries by a circle of small bony plates. Also, they are furnished with a nictitating membrane, which is an admirable provision, not only serving as a guard or curtain, but as an instrument to clear the eye of any incumbrance, and to lubricate it with a moisture which Nature has provided for the purpose. By these provisions, the sight of birds is rendered infinitely superior to that of all other animals; and this provision seemed the more necessary, from the peculiar modes of living to which this portion of created being was destined. A hawk will see a small bird at a distance, which neither men nor dogs could perceive; and a kite from an almost imperceptible height, will dart down on its prey with an unerring aim.

Granivorous birds have their structure different from those of the rapacious kind. Their gullet dilates, forming itself into a crop. This is furnished with salivial glands, whose office is, to moisten and soften the hard food on which they live, after which it passes on and is ground between two hard muscles, called the gizzard, whose action against each other is capable of attenuating the hardest substances; and, in order to assist this process, birds pick up sand, gravel, and other hard substances, which is necessary to mastication.

To birds, the return of spring is the beginning of pleasure. Those vital spirits, which seemed locked up during the winter, then begin to revive. Vegetables and insects supply abundance of food, and birds, having more than sufficient for their own subsistence, are impelled to transfuse life as well as maintain it. Those warblings, which constitute the delightful concert of the grove, are in reality challenges of anger between the males, or calls of allurement to the females. By these calls, the birds begin to pair, and provide for a future progeny. In our woods and our fields, we learn the lesson of inviolable fidelity: their compact holds with unbroken faith, and their tender solicitude for their young affords a noble example for the imitation of mankind.

Birds are admirably fitted for flying; their wings serve as oars, and their tails as rudders, to direct their motions. It is by the largeness and strength of the pectoral mus-

DSI

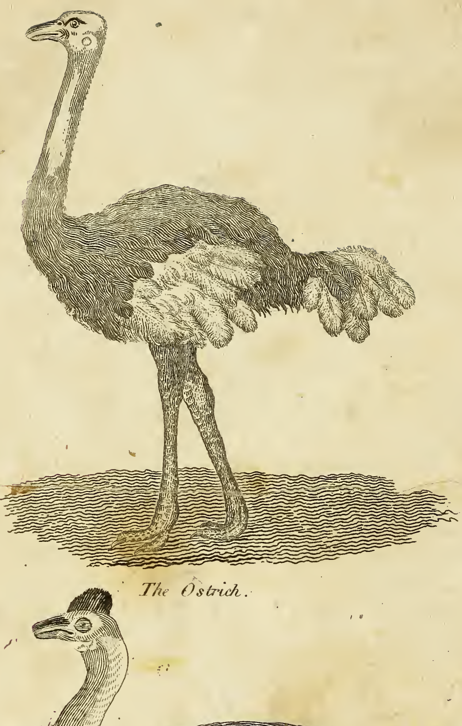
cles, that birds are qualified for flying. In men, these muscles scarce constitute a seventeenth part of the muscles of the body; but in birds they considerably outweigh all the other muscles together. This circumstance alone, i. e. the want of suitable muscles, renders all human attemps to fly, equally vain and fruitless: though there have not been wanting such attempts; and much ingenuity has been displayed in constructing wings for the purpose—but, the power of using them was beyond the reach of human art to supply. A fanciful genius of this description, once spent much time in building a pair of wings, with which he proposed taking his flight from the top of a barn. He was well advised, to fly up to the station, whence he intended to take his departure; but he observed, that " he would take a fair start, to give a fair trial." His intentions were to alight on a dunghill, which was situated at a small distance; but it happened, unfortunately, that a hog-pen lay between the two stations, over which he designed, most eagle-like, to soar. At length, he most courageously took his flight, and actually succeeded in alighting at the bottom of the hog-pen, though not entirely clear of bruises, and not without being pretty well bespattered with the mire at the bottom of the pen: nor did he extricate himself from his wings without considerable difficulty—this, with much struggling, he at length effected. And now it was, that, he was glad to leave his wings behind him in the pen, and take to flight on all-fours.

Birds exhibit a great variety of instinct: in their various evolutions; in the construction of their nests; in rearing their young; in procuring their food; in their associations, and their migrations. The structure of their nests, exhibits an admirable degree of mechanism: it is equally admirable, to observe the perfect similitude that appears in all the nests of birds of the same species; and the constant difference between the nests of one species and another! together, with the neatness and precaution which all of them observe. One species builds its nest on the top of trees; another on the ground, under a canopy of grass; or, with a shelter either of herbs, or a branch, or a double row of leaves, down which the rain slides, without entering the opening, which lies concealed below. The outward part of the nest is made of solid materials, as thorns, reeds, clay, or compact moss; while the inner is composed of softer materials, closely interwoven, so as to keep out wind, rain, or insects. But each species has its peculiar taste. When the building is completed, some hang the inside with a tapestry of feathers, or quilt it with wool or silk.

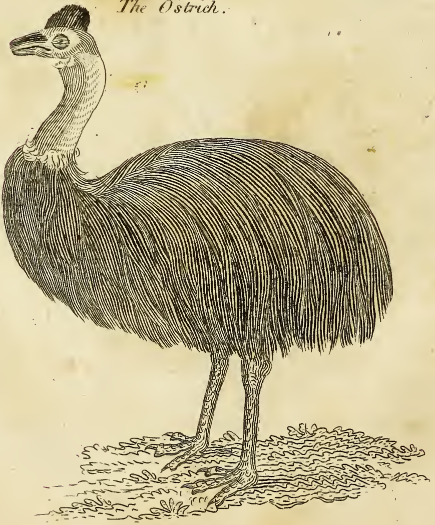
Nothing can exceed the patience of birds, while hatching; neither hunger nor danger can drive them from their nest. And nothing can exceed the tender assiduity and care which they manifest for their young. Sometimes one parent goes in quest of provisions, sometimes another, and sometimes both. They are up before the sun, and labour till the day is down; and the food which they procure, they distribute with great equality, giving each a portion in its turn, before ever they feed one bird twice. So great is their affection for their offspring, that it changes their natural disposition. Observe the hen when she is the parent of a family: she is no longer the same creature; she is no longer ravenous and insatiable; if she finds but a grain of corn, or a crumb of bread, she never touches it herself, but calls her chicks by a note which they understand, and divides it among them. She is no longer fearful and timorous, but at the head of her troop boldly attacks dog, cat, or any thing that approaches near to disturb her young.

Birds manifest a surprising instinct in discriminating and selecting their food. In whatever manner, and on whatever materials they feed, their forms and powers are exactly adapted to the various circumstances. Sparrows, and in general, all granivorous birds, which live upon seeds, which they find scattered up and down through the fields and the groves, require no great effort to obtain it, or break or tear it in pieces, therefore they are furnished with a small bill, as well as short legs and necks, which is sufficient for their purpose. But others, as the woodcock, snipe, curlew, &c. seek their food deep in the earth or slime. Hence, to accommodate their pe-

Pl. 23.



The Ostrich.



The Cossowary.

culiar modes, they are provided with a long neck and bill, and with these they dig and search and want for nothing. The woodpecker, which does not live on seeds, is differently formed. His bill is very long, solid, and strong; his tongue is sharp, and extremely long; beside which, it is armed with little points, and covered with glue towards the extremity. He has short legs, two talons before, two behind, and all very strong and crooked. All this equipage suits his particular manner of living. His food is worms or insects, that live in the heart of branches, or under the bark of old wood; the woodpecker is furnished with the requisite tools to find them out, and drag them from their retreats. The heron, on the contrary, feeds on frogs and small fish, which occupy marshy places, and shallow waters: hence, long legs, a long neck, a powerful bill, sharp and jagged, for the purpose of wading in the water, reaching to the bottom, penetrating the bogs, seizing, holding, and tearing his prey, would suit him best: consequently, with all these apparatus he is supplied. He is also supplied with large and powerful wings, to bear him aloft; enable him to make great movements in the air, and convey great burdens to his nest, which is frequently several leagues distant from the place where he fishes. And it is worthy, instructing, and entertaining, to observe, generally, how every species of the feathered tribe is formed, and adapted to its particular habits and necessities: from the ostrich, down to the humming bird. The ostrich is well adapted to live in, and traverse the burning desert; the falcon, to seize and tear his prey; the duck, to swim on the surface of, or dive in, the water; the swallow, to range the air, and feed on the nations of insects that people it; and, lastly, the humming bird, is fitted to admiration, for its peculiar modes of existence; which is, to range among the flowers, and quaff the nectar from their cups: this, indeed, may be contemplated, as an admirable specimen of creative wisdom. What a power of wing, to suspend itself in a fixed and immoveable position in the air; or dart, with a motion swifter than the eye can trace, from flower to flower: and its long needle-like bill, of such a delicate texture; so nicely adapted to its peculiar purpose! This challenges, even credulity itself, and is well calculated to enforce the pious conclusion—that the Creator hath done all things well.

Some birds associate together on particular occasions, or at particular seasons: others are constantly in flock, whether for the purpose of breeding or feeding. It is observed of the swallow, that, in the season of breeding, they will unite together for common defence. When they spy a hawk, or other bird of prey, they set up a peculiar kind of twittering; immediately, a number are observed to assemble together, and, when their force is sufficiently augmented, they instantly pursue and attack the common enemy, and drive him quite out of their district. After the season of breeding, and training up their little families, has transpired, the swallows are observed to assemble together in great numbers; this takes place early in the morning, and for several mornings in succession: this happens about the latter end of August, or beginning of September. At this time, they make a more than ordinary chattering; mount higher in the air, and make greater excursions than usual—soon after this, they take their departure. But, their mode of migrating is different from that of almost all the feathered tribe. They do not assemble in a body, for the purpose, and take their departure in large flocks, as practised by the pigeon, black bird, &c.—but they all at once become silent, and depart singly. The time of their flight, is about an hour or two before sunset. At this time, they deviate from their usual manner of flying, in circular evolutions in the air, and continue on, in a direct course towards the south west; making daily approximations to the south, until they arrive at the districts, where they make their winter quarters. A strange report has prevailed, even among naturalists, respecting these birds; which is the more strange, because it is unprecedented, being totally unsupported by analogy or fact. It represents these birds as passing the winter in a torpid state; descending to the bottoms of rivers, and sinking deep in mud, or in the earth, or hanging by clusters in old trees;

that they are resuscitated by the return of spring, and come forth with new life and vigour: whereas, nothing can be farther from the truth; nothing can be more ridiculous and absurd. The truth is, all the species are migratory; and though their departure is conducted in such a way, as not to be generally observed; though they are not met with in prodigious flocks, of thousands upon thousands on their passage, yet, it is no argument against their actual migration. I have made them a subject of particular observation for a number of years, having always felt a more than ordinary interest in this portion of the feathered race; and every year, since my observations commenced, I have regularly seen them, about the beginning of September, making the same uniform and continued course towards the south.

In their migrations, birds discover an astonishing degree of instinctive knowledge. They appear to understand the times and seasons with an astronomical exactness; and to discriminate places and courses with geographical precision. Nor are they dependent on the counsel of numbers, or the experience of the old birds, for even the young birds, if retained till after the departure of the general body, when let loose, will immediately take to flight, and pursue the course direct to their proper rendezvous. They need no star to direct them, no compass to guide them: they pursue their journey over immense tracts of country, over seas, and even oceans, with unerring certainty. When Columbus, that genius of ceaseless fame, and matchless enterprise, was prosecuting his voyage in search of a western continent, he was assisted in his judgment and necessities by the birds of passage. With all the reason and judgment of a judicious naturalist, he altered his course and pursued that which he observed the birds to make. When his crew were wrought up to all the phrenzy of dispair, they were appeased by the appearance of a flock of birds; and though, a few moments before, they thought the breeze too rude, and that it carried them too fast from all human abodes, yet now they were induced to spread every rag of canvas, and catch every straggling breeze; and again, when they were on the point of breaking out in open mutiny, the appearance of a flock of birds suppressed their murmurs, and calmed their apprehensions, and again they courted the favouring gales. It is worthy of remark, that Columbus embarked just in the proper season for observing the flight of the passage birds to their winter retreats; which might be contemplated as a circumstance, in no small degree propitious to his enterprize.

All birds have near their tail a little bag, which contains oil. This, Nature has designed for the purpose of moistening their feathers. Geese, and in general, all water fowl, are furnished with two glands for the secretion of this oil; other birds have only one. In these glands are divers little cells, ending in two or three large ones, lying under the nipple of the oil bag. This nipple is perforated, and being pressed by the bird's bill, emits its oil.

In all birds we may observe the several parts adapted to their respective uses in the very best manner. In those that fly much, the wings are placed in such a manner, as to balance their bodies in the air, and give the swiftest progression possible. Otherwise they would reel, and fly unsteadily. But in those that are designed for swimming, the wings are placed out of the centre of gravity, nearer the head. Hence the necessity of stretching out the head and neck in an extraordinary manner, which gives them that awkward appearance they exhibit in flying.

All birds are furnished with feet as well as wings; because there is no food, or at least not sufficient for them, to be always had in the air. But if there were, yet such birds could take no rest; for having no feet, they could not perch upon trees, and if they alighted on the ground, they could not raise themselves again: which birds that have short legs can hardly do. Besides, the use of legs is indispensable, in laying their eggs, sitting, hatching, and brooding their young.

We shall close these remarks by a few brief observations on the comparative structure of birds, with that of other animals. The parts peculiar to birds, are, the bill, the membrane to draw over the eye; and the feathers and wings. Parts wanting in birds, are, teeth and lips; the bladder which they do not need; as they drink no more than just to moisten their food. Variations in the parts of birds, from those of men and beasts, are: in the ear, which is of a very peculiar make; in the division of the aorta in the spinal marrow, which is divided into two in the middle of the back; in the bones, which are all hollow; in the heart, which has a fleshy valve at the mouth of the vena cava; in the lungs, which are strongly joined to the back, for the greater conveniency of flight; in the stomach—birds have two or more, to supply the want of chewing; in the legs and feet; in their tails; in their pectoral muscles, which are the strongest of all, whereas in men the crural muscles are the strongest; in the brain, the cortical part being innermost, whereas in men it is outermost; in the bronchia, which extends to the very bottom of the abdomen, so as to contain a great quantity of air; in the ovaries, which in birds are single, and fastened on their back.

The following brief observations on the flight, and nidification of birds may be deemed interesting.

The flight of birds is various. Kites, and most of the falcon tribe, glide smoothly through the air, with scarce any apparent motion of the wings. Most of the order of pies fly quick, with a frequent repetition of the motion of the wings. Woodpeckers fly awkwardly, and by jerks, alternately rising and sinking. The gallinaceous tribes in general fly very strong, and swiftly; but their course is seldom long, by reason of the weight of their bodies. The columbine race is of singular swiftness; witness the flight of the carrier pigeon. The struthious race cannot fly, but still in running, their short wings are of great use, like sails to collect the wind, and accelerate their motion. Many of the greater cloven-footed water fowls, or waders, have a slow and flagging flight, but most of the lesser fly swiftly, and most of them with extended legs, to compensate for the shortness of their tails. Rails and gallinules fly with their legs hanging down. Coots and grebes are with difficulty forced from the water; but when they rise, fly swiftly. Grebes, and also divers, fly with their hind parts hanging downwards, by reason of the forward situation of their wings. Webb-footed fowls are various in their flight, several have a failing, or flagging wing, such as gulls. Penguins, and a species of auk, are denied the power of flight. Wild geese, when they fly in flocks, observe a particular order in flight, forming themselves in a triangular form, similar to the letter V, with the inverted point in front. In general, so uniform is the flight of birds of the same species, and so constantly various that of the different species, that to a nice observer the species will be very frequently identified by the particular mode of flying.

The same uniformity in birds of the same species, and variations in those of different species, is also observed in the work of nidification. Most birds are monogamous, or couple, in pairs. The male, as well as the female, of most birds, also, joins in the act of incubation, and always in that of nutrition.

Of the gallinaceous tribe, the greatest part are polygamous, at least in a tame state. The pheasants, many of the grous, partridges, and bustards, are monogamous; of the grous, the cock of the wood, and the black game, assemble the females during the breeding season by their cries.

The males of polygamous birds neglect their young, and in some instances, would destroy them if they met with them. The economy of the strutheous order (*ostrich*) has long been considered as doubtful in this respect. But it is now pretty satisfactorily ascertained, that the charge of neglect is ill founded; and that they manifest, even a great affection for their young; and continue to feed and guard them till they can provide for themselves. It is considered as probable, that the birds, which compose this order, are polygamous, like the common poultry, for they lay many eggs: the dodo, however, is said to lay but one.

All waders, or cloven-footed fowls are monogamous, and all with pinnated feet, are also monogamous; except the ruffs. The webb-footed fowls, observe the same order as far as can be observed with any degree of certainty. But many of the auks assemble in the rocks in such numbers, and each individual so contiguous, that it is impossible to determine their method in this article.

The nest of a bird is one of those daily miracles, that from its familiarity, is passed over without much regard. It is, nevertheless, a subject which presents the most interesting objects of consideration. Each bird after nuptials prepares a place suited to its species, for depositing its eggs and sheltering its little brood. The different genera and species, set about the task in a manner suited to their several natures. Yet, every individual of the same species, proceeds in the same manner, collects the very same materials, puts them together in the same form, and chooses the same situation, for placing this temporary habitation. Even the young bird of last year, who never saw the building of a nest, directed by a heaven taught sagacity, pursues the same plan in the structure of it, and selects the same materials, as its parent did before. Birds of the same species of different and remote countries, do the same. The swallows of Britain and America, observe the same order of architecture; and in many instances, they have been known to return to the same places in which they had reared their young the year before.

The nests of rapacious birds are rude, made of sticks and bents, but are often lined with something soft; they generally build in high rocks, ruined towers, and desolate places. Enemies to the whole feathered creation, they seem conscious of the danger of attacks, and seek solitude. A few build upon the ground. Shrikes, allied to the rapacious birds, build their nests in bushes, with moss, wool, &c.

The order of pies, is very irregular in the structure of their nests. Parrots, and in fact all birds with two toes forward, and two backward, lay their eggs in the hollows of trees. And most of this order creep along the bodies of trees, and lodge their eggs also within them. Crows build in trees: among them, the nest of the magpie, composed of rude materials, is made with much art, quite covered with thorns, and just a hole left sufficient for entrance.

The nests of the orioles are contrived with wonderful sagacity; they are hung at the end of some bough or between the forks of extreme branches. All the gallinaceous, and strutheous orders lay their eggs on the ground. The columbine race makes a most artless nest, a few sticks laid across may suffice. Most of the passerine order build their nests in shrubs or bushes, and some in old walls, or banks. Some in the torrid zone are pensile, from the boughs of high trees; that of the taylor bird is a wonderful instance. Some of this order, as larks and goatsuckers, build on the ground. Some swallows make a curious plaster nest beneath the roofs of houses, and an Indian species makes its nest of a certain glutinous matter, which are collected as delicate ingredients for soups of certain epicures.—Most of the cloven footed water fowl, or waders, lay on the ground. Spoonbills and the common herons build on trees, and make up large nests with sticks &c. Storks build on churches, or the tops of houses. Coots make a great nest near the water side. Grebes in the water, a floating nest, adhering to some reeds. Avosets, terns, some of the gulls, mergausers, and ducks build on the ground; the last strip the down from their breasts to make a warmer nest for their young. Auks and guillemots lay their eggs on the naked shelves of high rocks. Penguins in holes in the ground. Among the pelicans, that which gives name to the genus, makes its nest in the desert, on the ground: shags sometimes on trees, corvorants and gannets on high rocks, with sticks; dried algæ and other course materials.

Rapacious birds in general lay few eggs. Eagles and the larger kind fewer than the lesser. The eggs of falcons and owls are rounder than those of most other birds, they lay more than six. The order of pies vary greatly in the number of their eggs. Parrots lay only two or three white eggs: crows lay six eggs, greenish mottled and dusky. Cuckoos as far as we can learn, lay only two. Woodpeckers, wrynecks, and king-fishers, lay eggs of a clear white, and semi-transparent colour; the woodpeckers lay six, the others more.

The nuthatch lays often in the year, eight at a time, white, spotted with brown. The hoopoe lays but two cinereous eggs. The creeper lays a great number of eggs. The honey-sucker, one of the least and most defenceless of birds, lays but two eggs: but the extinction of the genus is prevented, by a swiftness of flight that eludes every pursuit.

The gallinaceous order, the most useful of any to mankind, lay the most eggs, with the exception of the bustard, a bird that hangs between the gallinaceous, and the waders, which lays only two. The columbine order lays but two white eggs: but the domestic kind breeding almost every month, increase prodigiously.

All of the passerine order lay from four to six eggs; except the titmouse and the wren, which lay from fifteen to twenty, and the goat-sucker, which lays only two. The struthious order differ much in the number of eggs; the ostrich laying many, as far as fifty; whereas the dodo lays but one.

The cloven footed water fowls, or waders, lay in general four eggs; the crane and the Norfolk plover seldom more than two. All the eggs of the snipe and plover genus, are of a dirty white, or olive, spotted with black, and scarce to be distinguished in the holes they lay in. The land rails (an ambiguous species) lay from fifteen to twenty. Of birds with pinnated feet, the coot and grebe lay from seven to eight.

Webb-footed birds differ in the number of their eggs. Those which border on the order of waders, lay few eggs: the avoset two: the flamingo three: the albatros, the anks, and guillemots lay only one egg a piece: the eggs of the two last, are strangely large in proportion to the bulk of the body of the bird: they are commonly of a pale green colour, spotted and striped so variously, that not two are alike, which gives every individual an opportunity of distinguishing its own on the naked rock, where astonishing multitudes assemble. Divers lay only two eggs. Terns and gulls three, of a dirty olive, spotted with black. Ducks lay from eight to twenty or more. Penguins but one. Of the pelican genus, the gannet lays but one. Shags or cormorants, six or seven, all white; the last are the most oblong of all eggs.

Naturalists have divided birds into six classes, viz. the rapacious, the pie, the poultry, the sparrow, the duck, and the crane kind; the four first, comprehending the various kinds of land birds; the two last, those that belong to the water.

Such is the division of Linnæus, with respect to this class of animals; and at first sight it appears natural and comprehensive; but should the young student enter into this naturalist's plan, he would find birds the most unlike in nature thrown into the same class. We shall therefore endeavour to observe a more natural method; and, keeping the general division in view, enter into some description of such birds as are most noted, or most worthy of observation.

Under one class or another, as they may be treated, the reader will probably find all the species; and when the leader of any tribe is described, and its history given, it will convey a very tolerable idea of all the varieties contained under it.

By the rapacious kind is to be understood that class of carnivorous fowl that subsist by rapine. They are distinguished by their beak, which is hooked, strong, and notched at the point; by their legs, which are short, muscular, and adapted for the purposes of tearing; by their talons, which are sharp and crooked; by their flesh, which is impure; and by their manners, which are fierce and cruel. But before we enter into a systematic detail, however, we beg leave to give the history of three or four birds which do not well range in any system: as, from their size and their incapacity of flying, they lead a life materially differing from the rest of the feathered creation. The foremost of these are,

The Ostrich. (*Struthio*. Pl. 23.) In taking a survey of the feathered tribe, the first animal that demands our attention seems to unite in itself, the class of quadrupeds with that of birds, and to form a connecting link in the great chain of animated nature. In appearance it resembles the camel; it is covered with a plumage more like hair than feathers; and its internal parts bear as near a similitude to those of the quadrupeds as of the bird creation.

The ostrich is generally seven feet high, from the top of the head to the ground, but from the back it is only four; so that the head and neck are above three feet long. From the top of the head to the rump, when the neck is stretched out in a right line, the length is six feet, and that of the tail about a foot more. One of the wings, when stretched out is about three feet: and at the end of each wing there is a kind of spur, almost like the quill of the porcupine. The plumage is generally black and white; the upper part of the head and neck are covered with fine white hair, and in some places there are small tufts of it, which grow from a single shaft, about the thickness of a pin. The neck of this animal, which is of a livid flesh colour, seems to be more slender in proportion than that of other birds, from its not being furnished with feathers: the head and bill somewhat resemble those of a duck; and the external form of the eye is like that of a man's, the upper eye-lids being adorned with lashes which are longer than those on the lid below. The thighs are large, fleshy, and wrinkled in the manner of a net; the legs are covered before with large scales; the foot is cloven, and has two toes of unequal sizes.

These animals seem formed to live among the sandy and arid deserts of the torrid zone; and in these formidable regions they are seen in large flocks, which, to the distant spectator, appear like a regiment of cavalry, and have often alarmed a whole caravan. There is no spot, however sterile, but what is capable of supplying them with provision; as they are of all creatures the most voracious, and possess surprising powers of digestion.—Hence they will devour leather, hair, stones, or any thing that is given, and those substances which the coats of the stomach cannot soften, are excluded in the form in which they were swallowed. In their native deserts, however, they are supposed to subsist principally upon vegetables. In Lybia they are used for travelling; and when mounted by men, will go swifter than a race-horse.

The Emu is only second to the ostrich in magnitude, and is by much the largest bird in the new continent. It is generally about six feet high, measuring from its head to the ground. The head is small, the neck long, the form of the body round, and the wings short, and entirely unfit for flying. Its thighs are remarkably thick; its legs are three feet long, and it differs from the ostrich in having an additional toe on each foot. It has no tail, but is covered from the back with long feathers which fall backward and cover the rump. It moves very swiftly; but in its course it uses a very odd kind of action, lifting up one wing, which it keeps elevated for a time, till letting it drop, it raises the other. The fleetest hounds are frequently thrown out in pursuing it: and we are told of one, which on being surrounded by the hunters, darted among the dogs with such irresistible fury, that they immediately gave way, and thus enabled it to escape in safety.

Cassowary. (Pl. 23.) This bird, though not so large as the former, appears more bulky to the eye; its body being nearly equal, and its neck and legs much thicker in proportion. It is about five feet and a half long, from the point of the bill to the extremity of the claws; the head and neck together are eighteen inches; the legs are two feet and a half; and the largest toe, including the claw, is five inches long. The wing is armed with five prickles of different lengths, but is so small that it does not appear, being concealed under the plumage of the back. The feathers are generally double, having two long shafts issuing from a short one which is fixed in the skin. The beards at the end of the large feathers are perfectly black, under which there is a kind of down, of a tawny colour.

The most singular part of this animal, however, is the head, which, though small, like that of the ostrich, is calculated to inspire some degree of terror. It is bare of feathers and armed with a sort of horny helmet, black before and yellow behind. The colour of the eye is a bright yellow, and the globe being near an inch and a half in diameter, renders the countenance equally singular and formidable. The bill is of a greyish brown; the neck of violet colour inclining to slate, and the claws black without and white within. It may also be observed, that about the middle of the neck there are two processes, formed by the skin, somewhat resembling the gills of a cock, but that they are blue as well as red. To sum up the whole, it has been observed that the cassowary unites in itself the head of a warrior, the eye of a lion; the defence of a porcupine, and the swiftness of courser.—Its mode of running is very singular; for instead of going directly forward, it seems to kick up behind with one leg, and then, makes a bound with the other. It is a native of the East Indies, in which part of the world it is only to be found.

Dodo. (Pl. 24.) This creature strikes the imagination as one of the most unwieldy and inactive in nature. Its round and massive body is barely supported upon two short thick legs, like pillars! while its neck and head rise from it in a manner truly grotesque. The bill is of an extraordinary length, of a bluish white colour, and resembling, in its formation, two pointed spoons laid together by the backs. From all this results a stupid and voracious aspect, still further increased by a border of feathers round the beak, which forms a sort of hood, and completes this picture of stupid deformity.

The dodo seems weighed down by its own heaviness, and has scarcely strength to urge itself forward. Its wings, covered with soft ash-coloured feathers, are too short to assist it in flying; its tail, consisting of a few curled feathers, is displaced and disproportionate, and its legs are too short for running: in a word, it seems among the feathered race what the sloth is among quadrupeds, an unresisting creature, equally incapable of flight or defence. It is a native of the Isle of France; and the Dutch, who first discovered it there, called it, in their language, the nauseous bird, as well from its disgusting figure, as from the bad taste of its flesh.

Condor. (Pl. 24.) Birds of the rapacious order are all carnivorous; they associate in pairs, build their nests in the most lofty situations, and the female is generally larger than the male.

If size and strength, combined with rapidity of flight and rapacity, were allowed to deserve pre-eminence, no bird could be put in competition with the condor of America; which possesses, in a higher degree than the eagle, all the qualities that render it formidable, not only to the feathered kind, but to beasts, and even to man himself. The wings of this bird measure twelve feet three inches from tip to tip, and the great feathers, which are of a beautiful shining black, is two feet four inches long. The length of the beak is about four inches, and its thickness proportionable to the rest of the body. A short down of a brown colour clothes the head, and its eyes are surrounded with a circle of reddish brown. The plumage on the breast, neck, and wings is of a light brown: that on the back rather darker. The legs are covered with black scales, and the toes are armed with claws of the same colour.

In several parts of the mountains of Quito, these animals have been known to carry away sheep and children; and to prevent which, requires the utmost exertion of the inhabitants and shepherds.

Butcher Bird. (*Lanius Excubitor*. Lin. Pl. 24.) This bird is about the size of a thrush, and it has a strong black bill, nearly an inch long, and hooked at the end, which, together with its carnivorous appetites, ranks it among birds of the rapacious class: though the slenderness of its legs, and the formation of its toes, seem to make it a shade between them and such as subsist chiefly upon grain and insects. The feathers on the upper part of the body are of a reddish ash-colour; those on the breast are white, diversified with a few dark coloured lines. The habits of this bird seem perfectly analogous to its conformation, as it lives as well upon flesh as upon insects, and thus seems to partake, in some measure, of a double nature.

The nest of the female is composed on the outside of white moss interwoven with long grass, and the interior is comfortably lined with wool. It is also worthy of remark, that instead of driving out their young, like other birds of prey, to shift for themselves, they keep them with care, and even when adult they do not forsake them, but the whole brood live in one family together, till on the returning season of courtship they separate, each to establish a little household of its own.

GOLDEN EAGLE. (*Aquila Chrysœtas.* Pl. 24.) The golden eagle, which is one of the largest of this noble family, is about three feet in length, and the extent of its wings is seven feet four inches. The head and neck are clothed with narrow pointed feathers, of a deep brown colour, bordered with tawny: the whole body also is of a dark brown, the back being finely clouded with a deeper shade of the same: the tail is brown, irregularly barred with an obscure ash colour. The beak is of a deep blue, and the eye of a hazel colour: The legs are yellow, strong, and feathered to the very feet; and the toes are armed with formidable claws.

This fierce animal may be considered among birds as the lion among quadrupeds: and in many respects they exhibit a strong similitude. Equally magnanimous, they contemn petty plunder, and only pursue animals worthy their conquest: the eagle also disdains to share the plunder of another bird, and whatever may be the calls of hunger, he never stoops to carrion, but leaves it for other animals more rapacious and less delicate than himself. Nor does the similitude of these creatures stop here: they have both sparkling eyes, and nearly of the same colour; their claws are of the same form: their breath equally strong, and their cry alike vociferous and terrifying.

The nest of this bird is usually built in the most inaccessible cliff of a rock, and generally shielded from the weather by some jutting crag that hangs over it. The period of incubation is said to be thirty days: and when the young are hatched, both the male and female exert all their industry to provide for their wants.

In the rear of this terrible bird might be considered the ring-tailed eagle, common eagle, bald eagle, rough-footed eagle, erne, and clack eagle. But though these and others that might be enumerated, form different shades in this fierce family, they have all the same rapacity, the same general form, the same habits, and the same manner of bringing up their young.

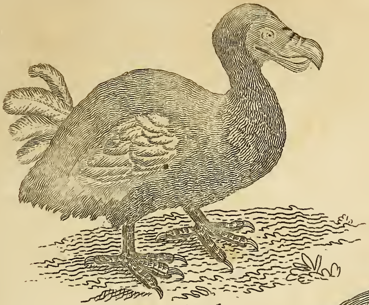
VULTURE. (Pl. 25.) The golden vulture, which seems to be the foremost of the tribe, is about four feet and a half long, from the end of the beak to that of the tail. The head and neck are only covered with a few scattered hairs, and the eyes are more prominent than those of the eagle. The plumage on the breast and belly is of a reddish colour: the back is black, but the tail and wings are of yellowish brown.

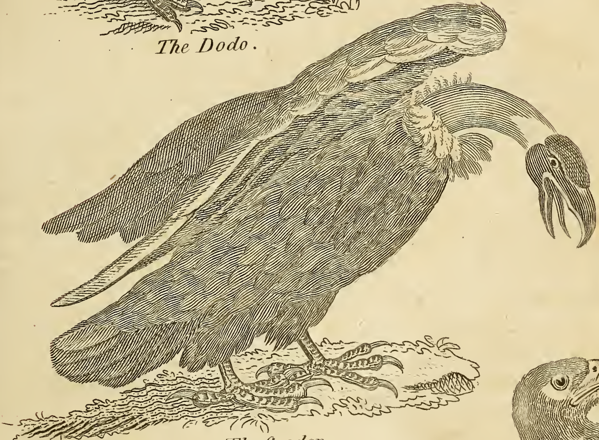
This cruel, unclean, and indolent bird, though totally unknown in England, is common in many parts of Europe; and in Egypt, Arabia, and many other kingdoms of Africa and Asia, vultures are found in great abundance. In Egypt, and particularly in Grand Cairo, there are great flocks of them, which render a most important service to the inhabitants, by devouring all the filth and carrion which might otherwise render the air pestilential.

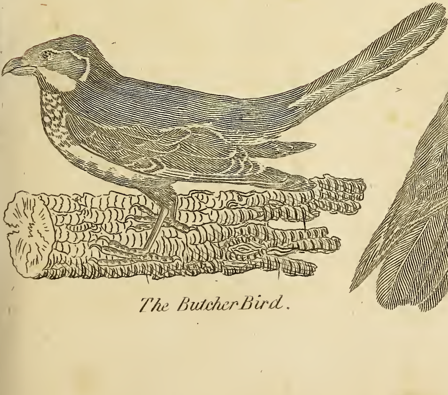
In Brazil these birds may be deemed peculiarly serviceable, from the circumstance of their checking the increase of the crocodile tribe. The female crocodile frequently lays her eggs, to the number of one or two hundred, on the side of the river, and covers them carefully with the sand, to conceal them from all other animals. In the mean time a number of vultures watch her motions from the branches of some neighbouring forest, and, on her retiring, they encourage each other with loud cries, pour down upon the spot, lay the eggs bare, and devour them in a few moments.

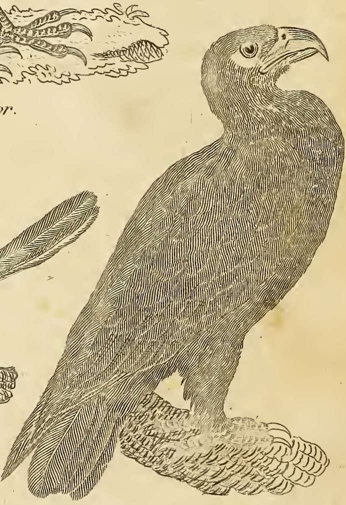
Vultures make their nests in the most remote and inaccessible rocks, and produce but once a year. Those of Europe, indeed, seldom come down into the plains, except when the rigours of winter have banished from their native retreats all living animals but themselves. Their flesh is lean, stringy, and altogether nauseous.

Pl. 24.


The Dodo.


The Condor.


The Butcher Bird.


The Golden Eagle.

The varieties of this tribe are the ash-coloured and the brown vulture of Europe; the spotted and the black vulture of Egypt; the bearded vulture, the Brazilian vulture, and the king of the vultures, of South America. These, however, all agree in their nature and habitudes, being equally indolent, filthy, and rapacious.

Secretary Falcon. This curious bird resembles the common falcon in its head, bill, and claws; but its legs are so long, that when standing erect, it is not much unlike the crane. The general colour of the plumage is a bluish ash; the tips of the wings, the thighs, and the vent inclining to black. On the back of the head are several long dark coloured feathers, hanging down behind, and capable of being erected at pleasure. This crest induced the Dutch colonists at the Cape to give it the name of the secretary; the Hottentots, however, style it the serpent-eater, from the avidity with which it seizes and devours those noxious reptiles.

Osprey or Sea Eagle. (*Falco Haliœtus.* Pl. 25.) This bird is nearly as large as the golden eagle, measuring in length three feet and a half, but its expanded wings do not reach above seven feet. Its bill is large, much hooked, and of a bluish colour; irides in some light hazel, in others yellow; a row of strong bristly feathers hangs down from its under bill next to its throat, whence it has been termed the bearded eagle: the top of the head and back part of the neck are dark brown, inclining to black: the feathers on the back are variegated by a lighter brown, with dark edges; the scapulars are pale brown, the edges nearly white; the breast and belly whitish, with irregular spots of brown; the tail feathers are dark brown, the outer edges of the exterior feathers whitish; the quill feathers and thighs are dusky: the legs and feet yellow; the claws, which are large, and form a complete semi-circle, are of a shining black.

It is found in various parts of Europe and America: it is said to lay only two eggs during the whole year, and frequently produces only one young bird; it is however wide dispersed, and was met with at Botany Island by Captain Cook. It lives chiefly on fish; its usual haunts are by the sea shore; it also frequents the borders of large lakes or rivers; and is said to see so distinctly in the dark, as to be able to pursue and catch its prey during the night.

KITE. (*Aquila Milvus.* Pl. 25.) Of all obscene birds the kite is the best known, and may be easily distinguished from the rest of the tribe by his forked tail, and his slow floating motion, seeming almost for ever upon the wing. He appears, indeed, to rest himself upon the air without making the smallest effort in flying. As almost every bird of the air is able to elude its pursuit, he subsists only upon accidental carnage; and may be considered as an insidious thief, who, on finding a small bird wounded, or a young chicken strayed from its mother, improves the moment of calamity to his own advantage. Sometimes indeed his hunger urges him to acts of desperation. We have seen one fly round and round, for a while, to mark a clutch of chickens, and then suddenly dart upon the unresisting little animal, and carry it off; the parent hen in vain crying out, and the boys hooting and casting stones, to scare it from its plunder.

This bird is common in England, where it continues the whole year. It is found in various parts of Europe, in very northern latitudes, whence it retires towards Egypt before winter, in great numbers; it is said to breed there, and return in April to Europe, where it breeds a second time, contrary to the nature of rapacious birds in general. The female lays two or three eggs of a whitish colour, spotted with pale yellow, and of a roundish form.

COMMON BUZZARD. (*Æruginosus.* Pl. 25.) Naturalists have distinguished the buzzards from the eagles and hawks by their habits and dispositions, which they compare to those of the vultures, and place them after those birds. Though possessed of strength, agility, and weapons to defend themselves, they are cowardly, inactive, and slothful; they will fly before a sparrow-hawk, and when overtaken, will suffer themselves to be beaten, and even brought to the ground, without resistance.

The buzzard is about twenty inches in length, and four feet in breadth from tip to tip of the wings. His head is large, and armed with a short hooked bill. The plumage on the upper part of the body is of a darkish dun; the belly of a yellowish white, with rusty spots on the breast. The thighs are large, and feathered below the knee; and the legs and feet are covered with scales.

This bird is well known in England, and is of a sedentary and indolent disposition; it continues for many hours perched upon a tree or revenue, whence it darts upon the game that comes within its reach: it feeds upon small quadrupeds, reptiles, and insects. Its nest is constructed with small branches, lined in the inside with wool and other soft materials; it lays two or three eggs, of a whitish colour spotted with yellow. It feeds and tends its young with great assiduity.

Moor Buzzard. (Pl. 25.) This bird's length is about twenty-one inches. The bill is black; cere and eyes yellow; the whole crown of the head is of a yellowish white, lightly tinged with brown; the throat is of a light rust colour: the rest of the plumage is of a reddish brown, with pale edges; the greater wing-coverts are tipped with white: the legs are yellow; and claws black.

The moor-buzzard preys on rabbits, young wild ducks, and other water fowl; and likewise feeds on fish, frogs, reptiles, and even insects: its haunts are in hedges and bushes, near pools, marshes, and rivers that abound with fish. It builds its nest a little above the surface of the ground, or in hillocks covered with thick herbage: the female lays three or four eggs of a whitish colour, irregularly sprinkled with dusky spots. Though smaller, it is more active and bolder than the common buzzard, and when pursued, it faces its antagonist, and makes a vigorous defence.

Birds of this kind vary much; in some the crown and back part of the head are yellow; and some have been seen uniformly of a chocolate brown, with a tinge of rust colour.

Falcon. (Pl. 26.) This is a very elegant bird, and is larger than the goshawk. Its bill is much hooked, and yellow; the iris is dusky; the throat white, as is likewise the general colour of the plumage, but spotted with brown; the breast and belly are marked with lines, pointed downwards; the spots on the back and wings are larger; the feathers on the thighs are very long, and of a pure white; those of the tail are barred: the legs are of a pale blue, and feathered below the knee. This bird is a native of the cold and dreary climates of the north, and is found in Russia, Norway, and Iceland: it is never seen in warm, and seldom in temperate climates: it is found but rarely, in Scotland and the Orkneys. Next to the eagle, it is found to be the most formidable, the most active, and the most intrepid of all voracious birds, and is the dearest, and most esteemed for falconry. It is transported from Iceland and Russia into France, Italy, and even into Persia and Turkey; nor does the heat of these climates appear to diminish its strength, or blunt its vivacity. It boldly attacks the largest of the feathered race; the stork, the heron, and the crane, are easy victims: it kills hares by darting directly upon them. The female, as in all other birds of prey, is much larger and stronger than the male, which is used in falconry to catch the kite, the heron, and the crow.

There is another of this tribe, called the peregrine or passenger falcon, which is rarely met with in Britain, and consequently is but little known there: it is about the size of the former; its bill is blue, black at the point; ceres and irides yellow; the upper parts of the body are elegantly marked with bars of blue and black; the breast is of a yellowish white, marked with a few small dusky lines; the belly, thighs, and vent are of a greyish white, crossed with dusky bands; the quills are dusky, spotted with white; the tail is finely barred with blue and black: the legs are yellow; the claws black.

GOSHAWK. (*Palumbarius*. Ray. Pl. 26.) This bird is somewhat longer than the buzzard, but slenderer and more beautiful; its length is one foot ten inches: its bill is blue, tipped with black; cere green; eyes yellow; over each eye there is a whitish line: the head and all the upper parts of the body are of a deep brown colour; each side of the neck is irregularly marked with white; the breast and belly are white, with a number of wavy lines

Pl. 2.

The Vulture.

The Osprey or Sea Eagle.

The Kite.

The Moor-Buzzard.

The Common Buzzard.

or bars of black; the tail is long, of an ash colour, and crossed with four or five dusky bars; the legs are yellow, and the claws black; the wings are much shorter than the tail.—It feeds on mice and small birds, and eagerly devours raw flesh; it plucks the birds very neatly, and tears them into pieces before it eats them, but swallows the pieces entire; and frequently disgorges the hair rolled up in small pellets.

The goshawk is found in France and Germany; it is not very common in this country, but is more frequent in Scotland; it is likewise common in North America, Russia, and Siberia: in Chinese Tartary there is a variety which is mottled with brown and yellow, that are used for sporting by the nobility.

SPARROW-HAWK. (*Falco Sparverius*. Pl. 26.) This bird is somewhat larger than a common pigeon: the bill is short and hooked, the tail rather long, and the legs slender and of a reddish colour. The plumage on the wings and upper parts of the body is brown, spotted with a yellowish dun; the lower parts in some are whitish; in others of a russet colour.

The female builds her nest in hollow trees, high rocks, or lofty ruins, sometimes in the old nest of a crow, and generally lays four or five eggs, marked with reddish spots at the longer end. Its bill is blue, furnished with bristles at the base, which overhang the nostrils; the colour of the eye is bright orange; the head is flat at the top, and above each eye is a strong bony projection; a few scattered spots of white form a faint line running backward towards the neck: the top of the head and all the upper parts of the body are of a dusky brown colour; on the back part of the head there is a faint line of white; the scapulars are marked with two sorts of white on each feather; the greater quill feathers and the tail are dusky, with four bars of a darker hue on each; the inner edges of all the quills are marked with two or more large white spots; the tips of the tail feathers are white; the breast, belly, and under coverts of the wings and thighs are white, beautifully barred with brown; the throat is faintly streaked with brown; the legs and feet are yellow; claws black.

The sparrow-hawk is very numerous in various parts of the world, from Russia to the Cape of Good Hope. It can easily be made obedient and docile, and trained to hunt partridges and quails; it makes great destruction among pigeons, young poultry, and small birds of all kinds, which it will attack and carry off in the most daring manner.

Merlin. (Pl. 26.) The merlin is the smallest of the hawk kind, scarcely exceeding the size of a blackbird. Its bill is blue; cere and irides yellow: the head is of a rust colour, streaked with black, and edged with rust colour: quill feathers dark, tipped and margined in the inner webs with reddish white; the breast and belly are of a yellowish white, with streaks of rusty brown pointing downwards; the tail is long, and marked with alternate dusky and pale bars; the wings, when closed, do not reach quite to the end of the tail: the legs are yellow; and claws black.

This bird, though small, is not inferior in courage to any of the falcon tribe. It was used for taking larks, partridges, and quails, which it would frequently kill by one blow, striking them on the breast, head, or neck. This bird differs from the falcons, and all the rapacious kind, in the male and female being of the same size.

The merlin flies low, and with great celerity and ease. It preys on small birds, and breeds in woods, laying five or six eggs.

Owl. (*Strix.* Pl. 26.) All birds of the owl kind may be considered as nocturnal robbers, who, unfitted for taking their prey while it is light, surprise it at those hours of rest when the tribes of Nature are least in expectation of an enemy. It is not, however, as some have imagined, in the darkest nights, but in the dusk of evening or the dawn of morning that they are best fitted for seeing. It is then they come abroad in quest of plunder; and they carefully return to their retreats before the broad day-light begins to dazzle them with its splendour.

The larger animals of this tribe are called horned owls, from the circumstance of two or three feathers standing up on each side of the head over the ear, and resembling horns. One variety of these appears at first sight, as large as an eagle, but, on a closer inspection, he will be found considerably less. His plumage is of a reddish brown, diversified with black and yellow spots. The other varieties differ principally in their size.

The largest of these birds without horns is the owlet, with dusky plumes and black eyes; to which may be added, the screech owl, with blue eyes, and plumage of an iron grey; the white owl, with yellow eyes, and about as large as the former; the brown owl, so called from the colour of its beak and plumage, and the little brown owl, with yellowish eyes, and an orange-coloured bill.—All these varieties, however they may differ in their size and plumage, agree in their general characteristics of preying by night, and having their eyes formed for nocturnal vision. They have all likewise, a hideous note, which is often heard in the silence of midnight, and breaks the general pause with a horrid variation.

These birds are often seen in the northern parts of England; and at times, near the vicinity of London.

Cock. (Pl. 27.) All birds of this species being of the poultry kind, have white flesh and bulky bodies. They are furnished with short strong bills, for picking up grain, which constitutes their principal sustenance; their wings are short and concave, for which reason they are not able to fly far; and their toes are united by a membrane as far as the first articulation, being afterwards divided, as in those of the former class. The females generally make their nest on the ground, and lay a great number of eggs.

Of all other birds the cock seems to have been first reclaimed from the forest, and taken to supply the accidental failure of the luxuries or necessities of life. As he has thus been longest under the care and protection of man, so of all others he seems to exhibit the greatest number of varieties; there being scarcely two birds of this species that exactly resemble each other in form and plumage. The tail, which makes such a beautiful figure in the generality of these animals, is entirely wanting in some; and the feathers, which lie so sleek and regular in most of those we are acquainted with, are in a peculiar breed all inverted, and stand the wrong way.

In his native state of independence, as seen in the woods on the coast of Malabar, and in many islands of the Indian ocean, the plumage of this bird is black and yellow, and his comb and wattles are yellow and purple; and it is peculiarly worthy of observation that bones of this species, when boiled, are as black as ebony.—The varieties noticed above, with many others too tedious for enumeration, may be considered as indubitable marks of long captivity.

No animal has greater courage than the cock when opposed to one of his own species, and in every part of the world where refinement and polished manners have not entirely taken place, cock-fighting is a principal diversion. In China, India, the Phillippine Islands, and all over the East, it is a favourite sport even with kings and princes.—This bird is very attentive to his females, and sometimes perfectly infuriate in defence of his young.

The hen seldom clutches a brood of chickens above once a season, though instances have been known to the contrary. Provided, however, she be well fed and supplied with water, she will lay upwards of two hundred eggs in the course of a year. During the period of incubation, nothing can exceed her patience and perseverance; and when her little offspring are produced, her pride and her affection seem to alter her very nature, and render her equally bold and abstemious on their account, though naturally timid and voracious.

Peacock. (Pl. 27.) To describe the inimitable beauties of this elegant bird, in adequate terms, would be a task of no small difficulty. Its head is adorned with a tuft consisting of twenty-four feathers, whose slender shafts are furnished with webs only at the ends, painted with the most exquisite green, mixed with gold: the head, throat, neck, and breast, are of a deep blue, glossed with green and gold; the greater converts and bastard wings are of a reddish brown, as are also the quills, some of which are variegated with black and green; the belly and

Pl. 26.

The Goshawk.

The Falcon.

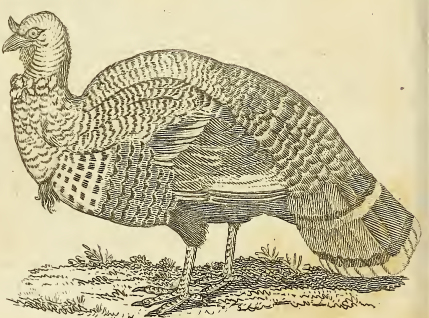
The Sparrow-Hawk.

The Merlin.

The Owl.

The Cock.

The Peacock.



The Turkey.

The Pheasant.

vent are black, with a greenish hue: but the distinguishing character of this singular bird is its train, which rises just above the tail, and, when erected, forms a fan of the most resplendent hues: the two middle feathers are sometimes four feet and a half long, and others gradually diminishing on each side: the shafts white, and furnished from their origin nearly to the end with parted filaments of varying colours ending in a flat vane, which is decorated with what is called the eye. When pleased or delighted, and in sight of his females, the peacock erects his tail, and displays all the majesty of his beauty: all his movements are full of dignity; his head and neck bend nobly back; his pace is slow and solemn, and he frequently turns slowly and gracefully round, as if to catch the sun beams in every direction, and produce new colours of inconceivable richness and beauty, accompanied at the same time with a hollow murmuring voice expressive of desire. The cry of the peacock, at other times, is often repeated and very disagreeable.

The peahen is somewhat less than the cock, and though furnished both with a train and crest, is destitute of those dazzling beauties which distinguish the male. She lays five or six eggs, of a whitish colour: for this purpose she chuses some secret spot, where she can conceal them from the male, who is apt to break them: she sits from twenty-five to thirty days, according to the temperature of the climate, and the warmth of the season. These birds were originally brought from the distant provinces of India, and thence have been diffused over every part of the world.

The female of this species, like the pheasant, have been known to assume the appearance of the male, by a total change of colour: this is said to take place after they have done laying.

White peacocks are not uncommon in England; the eyes of the train are barely visible, and may be traced by a different undulation of shade upon the pure white of the tail.

Turkey. (*Meliagris Galipavo.* Lat. Pl. 27.) The turkey, when young, is generally considered as one of the tenderest of birds; yet in its wild state it is found in great plenty in the forests of Canada, which are covered with snow above three parts of the year. It is there also, much larger than in a state of captivity, and its feathers are much more beautiful, being of a dark gray, bordered at the edges with a bright gold colour.

The hunting of these animals forms one of the principal diversions of the native Indian, as their flesh contributes to the support of his family. Having discovered their retreat, he sends his dog into the midst of the flock; and though the turkeys soon outstrip their pursuer by running, he continues to follow, till he at last forces them to take shelter in a tree, whence they are knocked down by a long pole, and easily taken.

Though extremely prone to quarrel among themselves, they are, in general, weak and cowardly against other animals, and are seen to fly from almost every creature that will venture boldly to oppose them. On the contrary, they pursue every thing that appears to dread them, particularly lap dogs and children: and after having made these objects of their aversion scamper, they evince their pride and satisfaction, by displaying their plumage, struting among their female train, and uttering their peculiar note of self-approbation. Some instances, however, have occurred, in which the turkey-cock has exhibited a considerable share of courage and prowess.

The female seems of a milder disposition than her consort. Rather querulous than bold, she hunts about in quest of grain and insects, and is particularly fond of the eggs of ants and caterpillars. She lays about eighteen or twenty eggs, and when her young begin to follow her in search of food, she rather warns them of danger than prepares to defend them.

Pheasant. (*Tetrao Umbellus*. Pl. 27.) Nothing indeed, can charm the eye with a greater richness and variety of ornament than this beautiful bird. The iris of the eye is yellow, and the eyes themselves are surrounded by a scarlet colour, sprinkled with specks of black. The top of the head and upper part of the neck are tinged with a darkish green, which shines like silk, and sometimes appears to change to blue, as it is differently presented to the eye of the spectator. The plumage on the breast, the shoulders, the middle of the back, and the sides under the wings, have a blackish ground, with edges tinged of an exquisite purple, and under this is a transverse streak of gold colour. The length of the tail, from the middle feathers to the root is about eighteen inches. The plumage of the female, however, is inferior to that of the male.

The pheasant is said to have been first brought into Europe from the banks of the Phasis, in Asia Minor, and to have been at first artificially propagated in Europe. However, notwithstanding the coldnes of the climate, and the tenderness of its constitution, it has multiplied in a wild state; and, as if disdaining the protection of man, has left him, to take shelter in the thickest woods and the remotest forests. In fact, this spirit of independence seems to attend the pheasant even in captivity. In the woods the female lays from eighteen to twenty eggs in a season; but in a domestic state she seldom produces above ten. In this manner, when wild, she hatches and brings up her brood with patience, vigilance, and attention; but when kept tame, she sits so ill, that a hen is generally her substitute upon such occasions. On all accounts, therefore, this bird seems better adapted to range at large in the woods than to be brought up in a state of captivity. Its fecundity, when wild, is sufficient to stock the forest: its beautiful plumage adorns it; and its flesh acquires a higher and more delicious flavour from its unlimited freedom.

Of this, as of all other domestic fowl, there are several varieties; such as white, crested, and spotted pheasants; but, of all others, the golden pheasant of China is the most beautiful.

The pheasant is met with throughout the United States, but chiefly in the more elevated and northern districts. According to Mr. Wilson, it is common at Moose fort, on Hudson's Bay, lat. 51°. It is frequent in the upper parts of Georgia; very abundant in Kentucky, and the Indianna territory; and was met with by captains Lewis and Clarke, in crossing the great range of mountains that divide the waters of the Missouri and Columbia, more than three thousand miles from the mouth of the former.

Pintada, or Guinea Hen. (Pl. 28.) This singular bird is about the size of a common hen, but, being supported on longer legs, it looks much larger. The head is covered with a kind of helmet; the back is round; and the tail turned downward, like that of a partridge. The whole plumage is black, or dark gray, diversified with white spots; and the wattles, proceeding from the upper chap, gives it a very peculiar aspect.

In many parts of Africa, these birds are seen in numerous flocks, feeding their young, or leading them in quest of food. All their habits resemble those of the poultry kind, and they agree in every other respect, except, that the male and female can only be distinguished by the colour of their wattles; those of the cock being of a bluish cast, while in the hen they are more inclined to red.

Bustard. (Pl. 28.) This bird is considerably larger than the turkey, the male generally weighing from twenty-five to twenty-seven pounds. The neck is a foot long, and the legs eighteen inches. The wings, however, are not proportionable to the rest of the body, being but four feet from the tip of one to that of the other; for which reason the animal flies with great difficulty. The head and neck of the male are ash-coloured; the back is barred transversely with rust-colour and black; the belly is white, and the tail is marked with broad black bars.

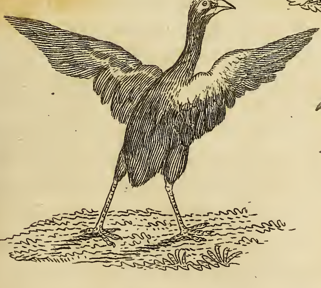
Bustards are frequently seen in large flocks in England on Salisbury Plain, the heaths of Sussex and Cambridgeshire, the Dorsetshire uplands, and as far as East Lothian in Scotland. Their food consists of the berries that grow among the heath, and the large earth-worms that appear on the downs before sun-rising in summer: and as their native plains afford no woods to screen the sportsman, nor edges to creep along, they may be said to enjoy an indolent security. As it often happens however, that they feed themselves so fat as to be incapable of

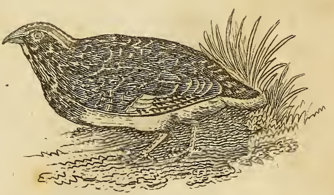
The Pintada, or Guinea Hen.

The Bustard.

he Wood-Grous, or Cock of the Wood.

The Partridge.





The Quail.

The Trumpeter.

flying without great preparation, they are sometimes run down by greyhounds.

The female makes her nest upon the ground, by merely scraping a hole, and lining it with a little straw or long grass. She lays two eggs, of a pale olive brown, diversified with dark spots; and the young ones run about as soon as they are hatched.

Wood Grous, or Cock of the Wood. (Pl. 28.) This bird is nearly the size of a turkey, and often weighs twelve or fourteen pounds; but the female is considerably smaller. The head and neck are ash-coloured and crossed with black lines; the body and wings of a chesnut brown; and the breast of a blackish glossy green.—The plumage of the female is very different.

This bird is chiefly found in mountainous and wooded situations; though in summer he occasionally ventures from his retreats, to make short depredations on the farmer's corn. When in the recesses of the forest he attaches himself principally to the oak and the pine tree; the cones of the latter serving him for food, and the branches affording him a habitation. He also feeds upon cranberries, ant's eggs, and insects; and his gizzard, like that of domestic fowls, contains a quantity of gravel, which is supposed to assist his powers of digestion.

The wood grous begins to feel the genial influence of spring at its earliest approach: and its courtship may be said to continue till the trees are entirely clothed with foliage and the forest in full bloom. During this season he may be seen, at sun-rise and setting, extremely active upon one of the largest branches of a pine-tree; his tail raised and expanded like a fan, his wings drooping, his neck stretched out, and his head swoln and red. His cry upon this occasion is a kind of loud explosion, followed by a noise like the whetting of a scythe; and as he now seems entirely deaf and insensible of danger, this is the time that sportsmen generally take to shoot him. Upon all other occasions he is the most timid and vigilant bird in nature.

The female generally chooses a dry place and a mossy ground for the purpose of incubation. She lays six or seven eggs, which are white and marked with yellow; and while sitting she is so remarkably tame and tranquil, that it is not easy to force her from her nest. When obliged to quit her eggs in quest of food, she covers them up so artfully with moss and dry leaves, that it is extremely difficult to discover them.

The black cock, the grous commonly so called, and the ptarmigan, are all birds of a similar nature with the preceding, and chiefly found in healthy mountains, or piny forests, at a distance from mankind. The black cock, (which derives its name from the colour of its plumage, though that of the female resembles a partridge,) is about half as large again as the partridge, and its colour like that of a woodcock, but redder. The ptarmigan is still somewhat less, and its plumage of a pale brown, or ash colour. These are all distinguishable from other birds of the poultry kind, by a naked skin, of a scarlet colour, above the eyes, in the place, and of the figure of eye-brows.

In most of the northern parts of Europe, even as far as Greenland. a bird of this species is met with, called the white grous; at times it visits the highest hills in Scotland, in the Hebrides and Orkneys, and sometimes, but rarely, on the lofty hills of Cumberland and Wales. The female lays eight or ten eggs, which are white, spotted with brown: she makes no nest, but deposits them on the ground. In winter they fly in flocks, and are so litttle accustomed to the sight of man, that they are easily shot or taken in a snare. They feed on the wild productions of the hills, which sometimes give their flesh a bitter taste.

PARTRIDGE. (*Perdix Virginianus*. Pl. 28.) The length of this bird is about thirteen inches. The bill is light brown; eyes hazel; the general colour of its plumage is brown and ash, elegantly mixed with black; each feather is streaked down the middle with buff colour; the sides of the head are tawney; under each eye there is a small saffron coloured spot, which has a granulated appearance, and between the eye and the ear a naked skin of a bright scarlet, which is not very conspicuous but in old birds; on the breast there is a crescent of a deep chesnut colour: the tail is short: the legs are of a greenish white, and are furnished with a small knob behind. The female has no crescent on the breast, and her colours in general are not so distinct and bright as those of the male.

Partridges are found chiefly in temperate climates; the extremes of heat and cold are equally unfavourable to them. They pair early in the spring: the female lays from fourteen to eighteen or twenty eggs, making her nest of dry leaves and grass upon the ground. The young birds learn to run as soon as hatched, frequently encumbered with part of the shell sticking to them. It is no uncommon thing to introduce partridges' eggs under the common hen, who hatches and rears them as her own; in this case, the young birds require to be fed with ants' eggs, which are their favourite food, and without which it is almost impossible to bring them up; they likewise eat insects, and when full grown, feed on all kinds of grain and young plants. The affection of the female for her young is peculiarly strong and lively: she is greatly assisted in her care of rearing them by her mate; they lead them out in common, call them together, point out to them their proper food, and assist them in finding it by scratching the ground with their feet; they frequently sit close by each other, covering their young with their wings, like the hen. In this situation they are not easily flushed; the sportsman, who is attentive to the preservation of his game, will carefully avoid giving any disturbance to a scene so truly interesting.

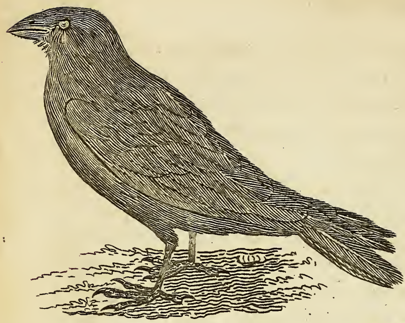
QUAIL. (Pl. 28.) This bird is much smaller than any of the former, being not above half the size of the partridge. The feathers on the head are black, edged with rusty brown; the breast is of a yellowish red, spotted with black: and the plumage on the back is marked with lines of pale yellow. Its form is exactly that of the partridge; and it resembles the generality of the poultry kind in its nature and habits.

Quails are almost universally diffused throughout Europe, Asia, Africa, and America; they are birds of passage, and are seen in immense flocks traversing the Mediterranean sea, from Europe to the shores of Africa, in the autumn, and returning again in the spring, frequently alighting in their passage on many of the islands of the Archipelago, which they almost cover with their numbers. On the western coasts of the kingdom of Naples such prodigious numbers have appeared, that an hundred thousand have been taken in a day within the space of four or five miles. The female makes her nest like the partridge, and lays to the number of six or seven eggs of a grayish colour, speckled with brown. The young birds follow the mother as soon as hatched, but do not continue long together; they are scarcely grown up before they separate; or, if kept together, they fight obstinately with each other, their quarrels frequently terminating in each other's destruction.

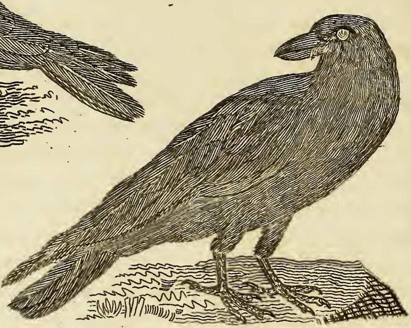
Trumpeter. (Pl. 28.) The trumpeter, so called from the singular noise it makes, is a native of the dry and mountainous forests of South America. It is about the size of a large fowl; the general plumage of the body black, with the fore part of the neck, and upper part of the breast of a fine changeable green. The legs are naked and scaly a little above the knees, with three toes placed before and one behind.

This bird is easily tamed, and discovers a considerable degree of attachment to those who notice and feed it. When bred in the house, it loads its master with caresses, and even follows him through the streets, like a dog. In a state of nature these animals associate in numerous flocks, feed on wild fruits, and walk and run with great celerity.

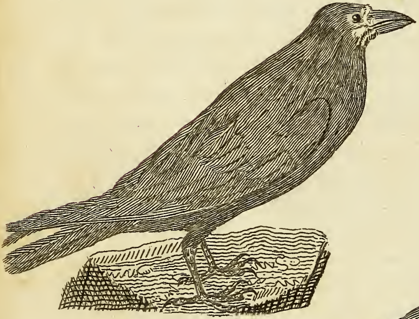
The most remarkable characteristic of these birds consists in the wonderful noise which they often make, either of their own accord, or when urged by their keepers. To induce them to this, it is sometimes necessary to entice the bird with a bit of bread to come near; and then making the same kind of sound, which the keepers make, the bird will imitate it. This noise sometimes resembles that of a trumpet, and gradually lowering to the moaning of a pigeon.



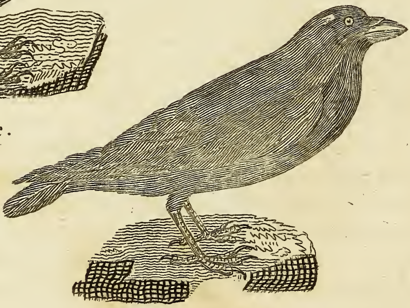
The Carrion Crow.



The Raven.



The Rook.



The Jack-Daw.

RAVEN. (*Corvus Corax.* Pl. 29.) The raven is so generally known that a long description would rather tend to obscure the reader's ideas than to gratify his curiosity. It is the largest of the pie kind; under which class of birds may be arranged all that noisy, restless, chattering tribe, that lies between the hen and the thrush, that from the size of the raven down to that of the woodpecker, flutter round our habitations, and make free with the fruits of human industry. They are, however, the most industrious, the most faithful, and the most connubial of volatiles; every species being true to its kind, and transmitting an unpolluted race to posterity. Their manners, as may naturally be supposed in so numerous a class, are very various: but they all agree in a few general characters; namely, in having hoarse voices, slight active bodies, and a facility of flight that baffles even the boldest of the rapacious kinds in the pursuit.

The raven is about two feet in length, and four in breadth. Its bill is strong, and very thick at the base; it measures somewhat more than two inches and a half in length, and is covered with strong hairs or bristles, which extend above half its length, covering the nostrils: the general colour of the upper parts is a fine glossy black, reflecting a blue tint on particular lights; the under parts are duller, and of a dusky hue.

This bird is found in every region of the globe, and is apparently uninfluenced by the changes of the weather: for when other birds are benumbed with cold, or pining with famine, he is busily employed in seeking for prey, or sporting in the coldest atmosphere. Sometimes indeed, he is seen perfectly white, which may probably be the effect of the rigorous climates of the north; but in all sitnations he appears active and healthy.

In his wild state the raven is an active and greedy plunderer. Nothing comes amiss to him; for whether his prey be living or completely putrescent, he falls too with a voracious appetite, and after satiating himself, he flies to acquaint his fellows, that they may participate of the spoil. His scent is so exquisite, that he can discover carrion at an immense distance; but if in his flight he perceives no signs of such a banquet, he contents himself with more unsavoury food, as fruits, insects, &c.

The female usually builds her nest in high trees, and lays five or six eggs of a pale green colour, marked with small brownish spots. She sits about twenty days, and her perseverance in the task of incubation is sometimes peculiarly worthy of observation. When taken under human protection, the raven may be trained up for almost any purpose to which a bird can be converted; he may be taught to fetch and carry like a dog, to speak like a parrot, or even to sing like a man.

CARRION CROW. (*Vultur Atratus*. Lath. Pl. 29.) This bird is less than the raven, but similar to it in its habits, colour, and external appearance. It is about eighteen inches in length; its breadth above two feet. Birds of this kind are more numerous and as widely spread as the raven; they live mostly in woods, and build their nests on trees: the female lays five or six eggs much like those of a raven. They feed on putrid flesh of all sorts; likewise on eggs, worms, insects, and various sorts of grain. They live together in pairs, and remain in England during the whole year.

ROOK. (Pl. 29.) The rook is about the size of the carrion crow, and, excepting its more glossy plumage, very much resembles it. The base of the bill and nostrils, as far as the eyes, is covered with a rough scabrous skin, in which it differs from all the rest, occasioned, it is said, by thrusting its bill into the earth in search of worms; but as the same appearance has been observed in such as have been brought up tame and unaccustomed to that mode of subsistence, we are inclined to consider it an original peculiarity. We have already had occasion to observe that they are useful in preventing a too great increase of that destructive insect the chafer or dor-beetle, and thereby make large recompense for the depredations they may occasionally commit on the corn-fields. Rooks are gregarious, and fly in immense flocks at morning and evening to and from their roosting places in quest of food. During the breeding time they live together in large societies, and build their nests on trees close to each other, frequently in the midst of large and populous towns. These rookeries, however, are often the scenes of bitter contests; the new-comers are frequently driven away by the old inhabitants, their half built nests torn in pieces, and the unfortunate couple forced to begin their work anew in some more undisturbed situation.

Jack-Daw. (Pl. 29.) This bird is considerably less than the rook, being only thirteen inches in length. Its bill is black: eyes white; the hinder part of the head and neck are of a hoary gray colour; the rest of the plumage is of a fine glossy black above; beneath it has a dusky hue: the legs are black.

The daw is very common in England, and remains with us the whole year: in other countries, as in France and various parts of Germany, it is migratory. They frequent churches, old towers, and ruins in great flocks, where they build their nests: the female lays five or six eggs, paler than those of the crow, and smaller; they rarely build in trees: in Hampshire they sometimes breed in the rabbit burrows. They are easily tamed, and may be taught to pronounce several words: they will conceal part of their food, and with it small pieces of money, or toys. They feed on insects, grain, fruit, and small pieces of flesh, and are said to be fond of partridges' eggs.

There is a variety of the daw found in Switzerland, having a white collar round its neck. In Norway and other cold countries they have been seen perfectly white.

Red-Legged Crow. This bird is about the size of the former: its bill is long, much curved, sharp at the tip, and of a bright red colour; the plumage is altogether of a purplish violet black: the legs are as red as the bill; the claws are large, much hooked, and black.

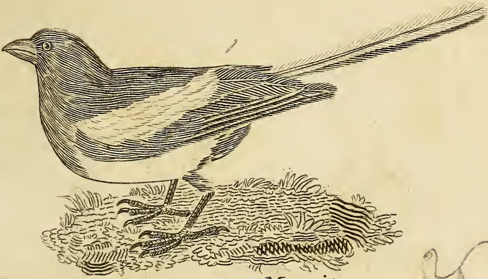
It builds on high cliffs by the sea-side, and chiefly frequents the coast of Devonshire and Cornwall, and likewise many parts of Wales: a few are found on the Dover cliffs, and some in Scotland. The female lays four or five white eggs, spotted with yellow. It is a voracious, bold, and greedy bird, and feeds on insects and berries: it is said to be particularly fond of the juniper berry. It is attracted by glittering objects, and has been known to pull from the fire lighted pieces of wood to the no small danger of the house.

MAGPIE. *Carvus Pica.* Lath. Pl. 30.) Its length is about eighteen inches. Bill strong and black; eyes hazel; the head, neck, and breast are of a deep black, which is finely contrasted with the snowy whiteness of the under parts; the neck feathers are very long, extending down the back, leaving only a small space, of a grayish ash colour, between them and the tail coverts, which are black; the plumage in general is glossed with green, purple, and blue, which catch the eye in different lights; the tail is very long, and wedge-shaped; the under tail-coverts, thighs and legs, are black; on the throat and part of the neck there is a kind of feathers, mixed with the others, resembling strong whitish hairs.

This beautiful bird is every where very common in England; it is likewise found in various parts of the Continent, but not so far north as Lapland, nor farther south than Italy: it is met with in America, but not commonly, and is migratory there. It feeds like the crow, on almost every thing animal as well as vegetable. The female builds her nest with great art, leaving a hole in the side for her admittance, and covering the whole upper part with a texture of thorny branches, closely entangled, thereby securing her retreat from the rude attacks of other birds: but it is not safety alone she consults; the inside is furnished with a sort of mattrass, composed of wool and other soft materials, on which her young repose: she lays seven or eight eggs, of a pale green colour, spotted with black.

The magpie is crafty and familiar, and may be taught to pronounce words, and even short sentences, and will imitate any particular noise which it hears. It is addicted, like other birds of its kind, to stealing, and will hoard up its provisions. It is smaller than the jackdaw, and its wings are shorter in proportion; accordingly its flight is not so lofty, nor so well supported: it never undertakes long journeys, but flies only from tree to tree, at moderate distances.

Pl. 30.



The Magpie.

The Jay.

The Roller.

The Starling.

Pl. 31.

The Thrush.

The Fieldſare.

The Cuckoo.

The Redwing.

The Woodpeker.

The Wood-Pigeon.

Jay. (Pl. 30.) The jay is one of the most elegant birds produced in the British islands. The head is covered with very long feathers, capable of being erected into a crest at pleasure. The forehead is white, streaked with black; the neck, black and white; and the tail is entirely black.

This bird is remarkable for its harsh grating voice, and restless disposition. Upon seeing the sportsman, it gives, by its cries, the alarm of danger, and thereby defeats his aim and disappoints him. The jay builds in woods, and makes an artless nest composed of sticks, fibres, and tender twigs: the female lays five or six eggs, of a grayish ash colour, mixed with green, and faintly spotted with brown.

Roller. (Pl. 30.) This rare bird is distinguished by a plumage of most exquisite beauty; it vies with the parrot in an assemblage of the finest shades of blue and green, mixed with white, and heightened by the contrast of graver colours, from which perhaps it has been called the German parrot, although in every other respect it differs from that bird, and seems rather to claim affinity with the crow kind, to which we have made it an appendage. In size it resembles the jay, being somewhat more than twelve inches in length. Its bill is black, beset with short bristles at the base; the eyes are surrounded with a ring of naked skin, of a yellow colour, and behind them there is a kind of wart: the head, neck, breast, and belly, are of a light pea-green; the points of the wings and upper coverts are of a rich deep blue; the greater coverts pale green; the quills are of a dusky hue, inclining to black, and mixed with deep blue; the rump is blue; the tail is somewhat forked; the lower parts of the feathers are of a dusky green, middle parts pale blue, tips black: the legs are short, and of a dull yellow.

This is the only species of its kind found in Europe; it is very common in some parts of Germany, but is so very rare in England as hardly to deserve the name of a British bird.

Starling. (Pl. 30.) The length of this bird is somewhat less than nine inches. The bill is straight, sharp-pointed, and of a yellowish brown—in old birds deep yellow; the nostrils are surrounded by a prominent rim; the eyes are brown; the whole plumage is dark, glossed with green, blue, purple, and copper, but each feather is marked at the end with a pale yellow spot; the wine coverts are edged with yellowish brown; the quill and tail feathers dusky, with light edges: the legs are of a reddish brown.

From the striking similarity, both in form and manners, observable in this bird and those more immediately preceding, we have no scruple in removing it from its usual place, as it evidently forms a connecting link between them, and in a variety of points seems equally allied to both. Few birds are more generally known than this, it being an inhabitant of almost every climate; and as it is a familiar bird, and easily trained in a state of captivity, its habits have been more frequently observed than those of most other birds. The female makes an artless nest in the hollows of trees, rocks, or old walls, and sometimes in cliffs overhanging the sea: she lays four or five eggs, of a pale greenish ash colour: the young birds are of dusky brown colour till the first moult. In the winter season these birds fly in vast flocks, and may be known at a great distance by their whirling mode of flight.

So attached are the starlings to society, that they not only join those of their own species, but also birds of a different kind, and are frequently seen in company with redwings, fieldfares, and even with crows, jackdaws, and pigeons. Their principal food consists of worms, snails, and caterpillars: they likewise eat various kinds of grain, seeds, and berries, and are said to be particularly fond of cherries. In a confined state they eat small pieces of raw flesh, bread soaked in water, &c. are very docile, and may easily be taught to repeat short sentences, or whistle tunes with great exactness, and in this state acquire a warbling superior to their native song.

Ring Ouzel. (Pl. 30.) This bird's general colour is of a dull black or dusky hue; each feather is margined with a greyish ash colour; the bill is dusky; corners of the mouth and inside yellow; eyes hazel; its breast is distinguished by a crescent of pure white, which almost surrounds the neck, and from which it derives its name: its legs are of a dusky brown. The female differs in having the crescent on the breast much less conspicuous, and in some birds wholly wanting, which has occasioned some authors to consider it as a different species, under the name of the Rock Ouzel.

These birds are found in various parts of Great Britain, chiefly in the wilder and more mountainous districts of the country: their habits are similar to those of the blackbird: the female builds her nest in the same manner and in similar situations, and lays four or five eggs of the same colour; they feed on insects and berries of various kinds, and are very fond of grapes.

THRUSH. (*Turdus*. Wil. Pl. 31.) The length of this bird is about eleven inches. The bill is dusky, the base of the lower bill yellow; the eyes hazel; the head, back, and lesser coverts of the wings are of a deep olive brown, the latter tipped with white; the lower part of the back and rump tinged with yellow; the cheeks are of a yellowish white, spotted with brown, as are also the breast and belly, which are marked with larger spots of a dark brown colour; the quills are brown with pale edges; tail feathers the same, the three outermost tipped with white; the legs are yellow; claws black. The female builds her nest in bushes or low trees, and lays four or five eggs, of a dirty flesh colour, marked with blood red spots. Its nest is made of moss, leaves, &c. lined with dry grass, strengthened on the outside with small twigs. It begins to sing very early, often on the turn of the year in blowing showery weather, whence in some places it is called the storm-cock. Its note of anger is very loud and harsh, between a chatter and a shriek, which accounts for some of its names. It feeds on various kinds of berries, particularly those of the misletoe, of which birdlime is made; it likewise feeds on caterpillars and various kinds of insects, with which it also feeds its young.

This bird is found in various parts of Europe, and is said to be migratory in some places, but continues in England the whole year, and frequently has two broods.

The song-thrush, or throstle, is distinguished among the singing birds, by the clearness and fulness of his note; his song is sweet and various, which begins early in spring, and continues best part of the summer.

Fieldfare. (Pl. 31.) This bird is somewhat less than the thrush. The bill is yellow; each corner of the mouth is furnished with a few black bristly hairs; the eye is light brown; the top of the head and back part of the neck are of a light ash colour, the former spotted with black; the back and coverts of the wings are of a deep hoary brown; the throat and breast are yellow, regularly spotted with black; the belly and thighs of a yellowish white; the tail brown, inclining to black; legs dusky yellowish brown; in young birds yellow.

The fieldfare is only a visitant in England, making its appearance about the beginning of October, in order to avoid the rigorous winters of the north, whence it sometimes comes in great flocks, according to the severity of the season, and leaves England about the latter end of February or the beginning of March, and retires to Russia, Sweden, Norway, and as far as Siberia and Kamtschatka. During the winter they feed on haws and other berries; they likewise eat worms, snails, and slugs.

There is a variety of this bird, of which the head and neck are of a yellowish white: the rest of the body nearly of the same colour, mixed with a few brown feathers; the spots on the breast faint and indistinct: the quill feathers perfectly white, except one or two on each side, which are brown; the tail is marked in a similar manner.

Fieldfares are sometimes seen singly, but in general form very numerous flocks, and fly in a body: and though they often spread themselves through the fields in search of food, they seldom lose sight of each other, but, when alarmed, fly off, and collect together upon the same tree.

Cuckoo. (*Cuculus*. Wil. Pl. 31.) This singular bird is nearly the size of a pigeon, shaped somewhat like a magpie, and distinguished from all other birds by its round prominent nostrils. The head, neck, back, and wing coverts are of a dove colour: the breast and belly are white, crossed with wavy lines of black; the tail consists of ten feathers;—the two middle ones black, with white tips;—the others dusky, and marked with alternate spots of white on each side of the shaft. The legs are of a yellow colour, and the claws white. Its principal food consists of flesh and insects.

The female cuckoo, soon after her arrival at her summer quarters, prepares to forward the grand design of Nature in the propagation of her kind: unlike all other birds, however, she neither provides a nest, nor betrays the least solicitude for the production of her young; but deposits her solitary egg in the nest of some other bird, and most generally in that of the hedge sparrow; this intrusion often occasions some disorder, for the hedge-sparrow, at intervals, while she is sitting, not only throws out some of her own eggs, but sometimes injures them in such a manner that they become addled: so that it frequently happens that not more than two or three of the parent bird's eggs are hatched; but it has never been observed that the egg of the cuckoo has either been thrown out or injured. When the hedge sparrow has set her usual time, and disengaged the young cuckoo and some of her own offspring from the shell, her own young ones and any of her eggs that remain unhatched, are turned out of the nest.

The young bird generally continues three weeks in the nest before it flies; and the foster parents feed it more than five weeks after this period. Hence it appears, that if a cuckoo were ready with an egg much sooner than the time pointed out, not a single nestling, even of the earliest, would be fit to provide for itself, before its parent would be instinctively directed to seek a new residence, and be thus compelled to abandon its offspring; for the cuckoos take their leave the first week in July.

Redwing. (Pl. 31.) This bird is not more than eight inches in length. The bill is of a dark brown colour; eyes deep hazel; the plumage in general is similar to that of the thrush, but a white streak over the eye distinguishes it from that bird; the belly is not quite so much spotted, and the sides of the body and the feathers under the wings are tinged with red, which is its peculiar characteristic; whence also it derives its name.

These birds make their appearance a few days before the fieldfare, and are generally seen with them after their arrival; they frequent the same places, eat the same food, and are very similar to them in manners. Like the fieldfare they leave us in the spring. The female builds her nest in low bushes or hedges, and lays six eggs, of a greenish blue colour, spotted with black.

All their season of music and pleasure, however, is employed in the more northern climates, where they sing most delightfully, among the forests of maples with which those countries abound.

Woodpecker. (*Picus.* Pl. 31.) Of this bird there are many kinds, and several varieties in each kind, but instead of descending into a minute discrimination of every species, we shall take one for a pattern, to which all the others bear the strongest affinity. Words can but feebly describe the plumage of a bird; but it is the province of history to mark every animal's pursuits and occupations.

The green woodpecker is about the size of the jay: the throat, breast, and belly are of a pale greenish colour; and the back, neck, and covert feathers of the wings are green. But the tongue is its most distinguished characteristic, as it serves both for its support and defence. This is round, ending in a sharp bony tip, dentated on both sides, like the beard of an arrow, and capable of being thrust out three or four inches from the bill, and drawn in again at pleasure.

Such is the instrument with which this bird is provided, and it is used in the following manner.—When a woodpecker, by its natural sagacity, finds a hollow or decayed tree, where there are worms, ants' eggs, or insects, it immediately prepares for its operations. Resting by its strong claws, and leaning on the thick feathers of its tail, it begins to bore with its sharp strong beak, until it discloses the whole internal habitation. It then sends forth a loud cry, upon which the whole insect tribe are thrown into confusion, and run hither and thither seeking for safety; while the invader luxuriously feasts upon them with leisure, darting in its long tongue, and devouring the whole brood. Sometimes, also, this bird alights upon the ground to try its fortune at an ant-hill, and seldom fails of procuring a rich repast.

The woodpecker generally chooses for its habitation trees that are decayed, or soft wood, as elm and poplar. In these, with very little trouble, it makes holes, as exactly round as a mathematician could with compasses; and here the female deposits her eggs, without any thing to keep them warm, except the heat of her own body. When the young are excluded from the shell, and before they leave the nest, they are adorned with a scarlet plumage under the throat, which adds considerably to their beauty.

WOOD-PIGEON. (*Columba Migratoria.* Lath. Pl. 31.) All the numerous and beautiful varieties of this tribe, derive their origin from the stock-dove, wood pigeon; which is of a deep bluish ash colour; the breast dashed with a fine changeable green and purple; the wings marked with two black bars; the back white, and the tail barred near the end with black. Such are the colours of the pigeon in its natural state; and from these simple tints the effects of domestication have produced a variety that words cannot describe, nor even fancy suggest.

The ring-dove is considerably larger than the former, and derives its appellation from a beautiful white circle round the neck. This bird builds its nest with a few dry sticks, in the boughs of trees; and is so strongly attached to its native freedom, that all attempts to domesticate it have hitherto proved ineffectual.

The carrier pigeon is distinguished from all others, by a broad circle of naked white skin which surrounds the eyes; and by the colour of the plumage, which is of a dark blue inclining to black. From their attachment to their native place, these birds are employed in several countries as the most expeditious carriers of letters; and formerly they were commonly used in carrying letters from place to place in time of war, and in case of sieges, when all other means of communication were intercepted, or cut off by the enemy. These birds have been known to fly at the rate of seventy-two miles in the space of two hours and a half.

TURTLE DOVE. (*Columba Carolinensis*. Wil. Pl. 32.) The turtle dove is a smaller bird than either of the preceding, and is easily distinguished by the yellow iris of the eye, and by a beautiful crimson circle that encompasses the eye lids.

The note of this bird is singularly tender and plaintive; in addressing his mate, the male makes use of a variety of winning attitudes, cooing at the same time in the most gentle and soothing accents; on which account the turtle dove has been represented, in all ages, as the most perfect emblem of connubial attachment and constancy. It arrives late in the spring, and departs about the latter end of August: it frequents the thickest and most sheltered parts of the woods, where it builds its nest on the highest trees; the female lays two eggs.

The fidelity of these birds has furnished poets and sentimental writers with the most beautiful allusions; and it is generally asserted, that if a pair be put in a cage, and one happen to die, the other will not survive it.

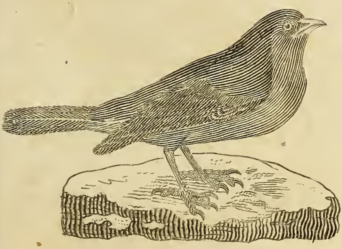
Mr. Wilson, the celebrated American ornithologist, has the following beautiful remarks on this bird. " It is a favourite with those who love to ramble in our woods in spring, and listen to their varied harmony. They will there hear many a singular and sprightly performer, but none so mournful as this. The hopeless woe of settled sorrow, swelling the heart of female innocence itself, could not assume tones more sad, more tender and affecting. Its notes are four; the first is somewhat the highest, and preparatory, seeming to be uttered with an inspiration of the breath, as if the afflicted creature were just recovering its voice from the last convulsive sobs of distress. This is followed by three deep and mournful moanings, which no person of sensibility can listen to without sympathy. A pause of a few minutes ensues, and again the solemn voice of sorrow is renewed as before. There is, however, nothing of real distress in all this; quite the reverse. The bird who utters it wantons by the side of his beloved partner, or invites her by his

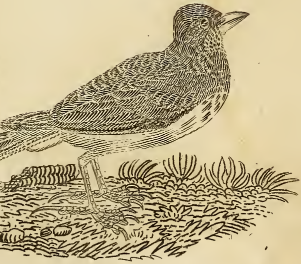
The Turtle Dove.

The Blackbird.

The Goldfinch.

The Wren.


The Redbreast.


The Lark.

call to some favorite, retired, and shady retreat. It is the voice of love, of faithful connubial affection, for which the whole family of doves are so celebrated; and among them all, none more deservingly than the present species."

Blackbird. (Pl. 32.) This bird is of the sparrow kind; which class chiefly resides in the neighbourhood of man, and are his peculiar favourites. The falcon may be more esteemed, and the turkey more useful; as animals reclaimed to supply some of the conveniences of life, but these little painted songsters conciliate our affections both by their beauty and their melody;—they fill our groves with harmony, and elevate our hearts to sympathise with their raptures.

The above beautiful and well known bird is one of the first that proclaims the genial spring, and his note, when heard at a distance, is the most pleasing of all the grove; though it is rather unpleasant in a cage, being loud and deafening. It is a solitary animal, generally found in sequestered woods, or rather retired situations. It feeds on worms, snails, insects, &c. but when domesticated it will eat any sort of flesh meat, either raw or dressed, provided it be not salt. The female builds an artificial nest, well plastered on the inside with clay, straw, and hair, and usually lays four or five bluish eggs.

Goldfinch. (*Fringilla Tristis.* Wil. Pl. 32.) This bird is universally esteemed, both for the melody of its note and the beauty of its colours. It is of a mild and gentle nature; soon becomes reconciled to captivity, and may be easily taught a variety of entertaining tricks.—The female generally builds in fruit trees, and lays five or six eggs of a white colour, speckled and marked with a reddish brown.

Wren. (*Sylvia.* Pl. 32.) This bird, which weighs only three drachms, and is but four inches in length, from the point of the bill to the end of the tail, is admired for the loudness of its note, compared with the little body whence it issues; and even when confined in a cage it has sometimes been known to sing as strong as in its native fields, and with equal freedom and mellowness of song. It commonly creeps about hedges or trees, in the vicinity of farm-yards, and sings very late in the evening, though not, like the nightingale, after the landscape is enveloped with darkness.—The female constructs a very curious nest, and lays from ten to fifteen eggs, which are very small, white and sprinkled with red spots.

Redbreast. (Pl. 32.) The red breast is less celebrated for its music than its attachment to mankind; its bill is slender and delicate; its eyes are large, dark, and expressive, and its aspect mild; its head and all the upper parts of its body are brown, tinged with a greenish olive: the neck and breast are of a fine deep reddish orange; a spot of the same colour marks its forehead: its belly is whitish, and the legs and feet of a dusky black. It is near six inches in length from the tip of the bill to the end of the tail, the former being about half an inch, and the latter two inches and a half.

This bird, in England, is reckoned to have the sweetest song of all others: the notes of other birds indeed, are louder, and their inflections more capricious; but the redbreast's voice is soft, tender, and well supported; and the more to be valued as we enjoy it the greatest part of the winter.

During the spring, this celebrated bird haunts the wood, the grove, and the garden, and retires to the thickest and shadiest hedge-rows to breed in: and in winter it endeavours to support itself, by chirping round the warm habitations of mankind, and by coming into those shelters where the rigour of the season is artificially expelled, and where insects are found in the greatest numbers, attracted by the same cause.—The female lays four to five eggs, of a dull white colour, diversified with reddish streaks.

Lark. (*Alauda.* Lath. Pl. 32.) All the birds of the name, including the sky-lark, the wood-lark, and the tit-lark, are distinguished from other small volatiles by the length of their heels; they are also louder in their song, but not so pleasing. Indeed the music of every bird in captivity is but the mirth of a little animal insensible of its unfortunate situation: it is the scenery of the umbrageous grove or rural landscape, the golden break of day, the fluttering from branch to branch, the soaring in the air, or the answering of its young, that gives the bird's song its true relish, and elevates the mind to a state of the highest yet most harmless exultation.—Nothing in this point of view, can be more gratifying than to see the lark warbling upon the wing: raising its note as it comes from the clouds, yet sinking by degrees as it approaches its nest—the spot where all its affections are centered—the spot that has excited all his joy, and called forth those harmonious strains.

The female builds her nest upon the ground, beneath some turf that serves to screen it from observation: she lays four or five eggs, of a dusky hue; and when her little family come forth, she may be seen fluttering over their heads, directing their motions, anticipating their wants, and sedulously guarding them from danger. Indeed, the instinctive attachment which this animal bears to her young is sometimes discovered at a very early period, and even before she is capable of becoming a mother.

The common food of the young larks is worms and insects; but after they are grown up they live chiefly on seeds, herbage, and most other vegetable substances.

Bulfinch. (Pl. 33.) This is a very common bird, and when at full growth measures, from the point of the bill to the end of the tail, six inches, of which the tail is two. It has a black short bill, very strong and crooked, the upper part hanging over the under like that of a hawk; the tongue short, and the eyes of a hazel colour; the head and neck in proportion to the body larger than the generality of small birds, from which, most probably, they derived their name. In some places they are called ropes; in others, thick bills, and in some hoops, probably from their wild hooping kind of note.

The bulfinch maks its nest of an ordinary mean fabric, in bushes, in which the female lays five or six eggs of a bluish colour, with dark brown and reddish spots. In the summer it mostly frequents woods, and the more retired places: but in winter it approaches gardens and orchards, where it makes great havoc among the buds of trees.

The cock is in size equal to the hen, but has a flatter crown, and excels her in the beauty of its colours. In a state of nature this bird has but three cries, all of which are unpleasant: but if a man deigns to instruct it methodically, and accustoms it to fine, mellower, and more lengthened strains, it will listen with attention; and the docile bird, whether male or female, without relinquishing its native airs, will imitate exactly, and sometimes even surpass, its master.

These birds must not be taken too young; they should be at least twelve days old: at first they must be fed the same as the young linnet, chaffinch, &c. with bread, milk, and rape-seed, made into a paste; and, when grown up, with rape and canary-seed, three-fouths rape, and one-fourth canary. They, as well as the starlings, require much pains to be taken with them in the early part of their education, and should never be fed without what they are wished to learn being repeated to them; they soon grow attentive, and generally by the time they are three months old, will begin to repeat to themselves, after which a very few lessons will render them perfect.

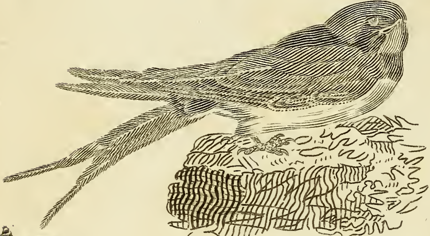
NIGHTINGALE. (Pl. 33.) This universally admired songster is not remarkable for the variety or richness of its tints; the upper part of the body being of a rusty brown, tinged with olive; the under parts of a pale ash-colour, inclining to white about the throat and belly. Its music, however, is exquisitely soft and harmonious, and is rendered still more pleasing as being exerted in the night, when the other warblers are all silent.

The nightingale visits England in the beginning of April, and generally retires in August. It is only found in some of the southern parts of the country, being totally unknown in Scotland, Ireland, and North Wales; and as it generally keeps in the middle of its favourite bush or tree, it is but rarely seen. The female constructs her nest of the leaves of trees, straw, and moss, and usually lays four or five eggs; but it seldom happens, even in the temperate climate of England, that all these

Pl. 33.

The Bullfinch.

The Nightingale.


The Swallow.

The Canary.

The Martin.

The Linnet.

The Sparrow.

come to maturity. While she performs the duty of incubation, the male sits on some adjacent branch, to cheer the tedious hours by his harmonious voice, or, by the short interruption of his song to give her timely notice of approaching danger.

SWALLOW. (*Hirundo.* Pl. 33.) The swallow and its varieties may be easily distinguished by their short slender feet, and their very large mouths which, when they fly, are always kept open: their wings are also of immoderate extent for their bulk; their plumage is glossed with a rich purple; and their note is a slight twittering, which they seldom exert but upon the wing.

Early in the spring, when the solar beams begin to rouse the insect tribes from their annual state of torpidity, the swallow is seen returning from its long migrations beyond the ocean; and in proportion as the weather grows warmer, and its insect supply increases, it gathers strength and activity. The female builds her nest with great industry on the tops of chimnies, and sometimes breeds twice a year. These birds retire from the temperate latitudes, about the latter end of August, or beginning of September, and repair towards the equator, to pass the winter in more congenial climates.

MARTIN. (Pl. 33.) This bird is inferior in size to the swallow, and its tail is much less forked. The plumage, however, is nearly the same; the upper part of the body, wings, and tail being black glossed with purple: and the under parts white. These birds sometimes build against the sides of cliffs that overhang the sea; but more frequently under the eaves, in the corners of windows, or under cornices. The materials of the nest are earth, tempered and mixed with straw, and lined with feathers.

It would be extremely difficult to bring up these birds in a state of confinement; owing to their subsisting entirely upon insects.

CANARY. (Pl. 33.) The canary bird or canary finch, was originally peculiar to those islands from whence the name is derived. They appear to have been first brought into Europe about the fourteenth century, but they are now so commonly bred in our own country, that they may be easily procured. It is about five inches and a half in length; the bill is of a plae flesh colour; the plumage is in general yellow, more or less mixed with gray, and in some with brown on the upper parts; the tail is somewhat forked; the legs are a pale flesh colour.

There are twenty-nine varieties, and many more might be added to the list. In the places fitted up for the rearing and breeding these charming birds, we are delighted to see the workings of nature exemplified in the choice of their mates, building their nests, hatching and rearing their young, and in the impassionate ardour exhibited by the male in assisting his faithful mate in collecting materials for her nest, in arranging them for her accommodation, in providing food for her offspring, or in chaunting his lively and amorous songs during every part of the important business. The canary will breed freely with the siskin and goldfinch; it likewise proves prolific with the linnet; and also admits, but unwillingly, the chaffinch, yellow bunting, and even the sparrow, though with still more difficulty. In all these instances, excepting the first, the pairing succeeds best, when the female canary is introduced to the male of the opposite species.

Linnet. (Pl. 33.) This favourite bird, which is universally admired for the melody of its voice, is in length, from the point of the bill to the end of the tail, five inches and a half; the bill bluish gray, the eyes hazel, the upper parts of the head, neck, and back, are of a dark reddish brown; the edges of the feathers pale; the under parts are of a dirty reddish white; the breast is deeper than the rest, and in spring becomes a very beautiful crimson: the sides are spotted with brown likewise, with white edges, except the two middle feathers which have no margins, it is somewhat forked; the legs are brown.

The linnet is so much esteemed for the sweetness of his singing, that, by many persons, he is thought to excel all small birds. He has certainly a curious fine note of his own, little inferior to the most celebrated birds, and may be taught likewise to pipe or whistle the song of any other bird; but as his own is so good, that trouble is unnecessary. He is, however, very apt in learning, and if brought up from the nest, will take the woodlark's or canary's song to perfection. In some instances it has been said to pronounce words with great distinctness.

The cock linnet may be known, either old or young, by these two marks; first, the feathers on his back are much browner than those of the hen; and secondly, by the white on the three or four longest feathers of the wing: if it appear clear, bright, and broad, and reach up to the quills, it is a sure sign of a cock bird: for the white in the wing of the hen is much less, fainter, and narrower.

These birds commonly build in a thick bush, or hedge, and sometimes among furze bushes, &c. making a small, pretty nest, the outside of bent dried weeds, and other stubble matter, and the bottom all matted together: the inside of fine soft wool, mixed with down stuff, gathered from dried plants, with a few horse hairs, made exceedingly neat and warm, on which she lays four, and sometimes five white eggs, with fine red specks, especially at the blunt end; and has young ones by the middle of April or beginning of May. The young may be taken at ten days old or sooner; it is very necessary, however, that they should be kept very warm, clean, and fed at least once in every two hours. Their food at first should consist of rape-seed, soaked eight or ten hours in water, and afterwards boiled in a little milk.—They are particularly fond of linseed, from which it is supposed they derive their name.

Sparrow. (Pl. 33.) The sparrow is one of the most familiar of volatiles, constantly fluttering round our habitations, and seldom absent from our orchards and gardens. It is universally hated by farmers as injurions to their rural economy; yet its utility has been clearly proved to overbalance its depredations: for it has been known that a single pair of sparrows, during the time they have to feed their young, destroy on an average every week between thirty and forty thousand caterpillars, besides a variety of winged insects.

These birds generally build their nests under the eaves of houses, or in holes in the walls; and the affection of the female towards her young is equally strong and interesting.

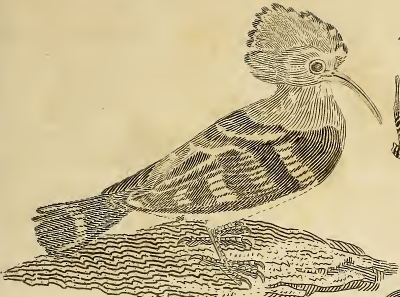
NUTHATCH. (*Sitta.* Wil. Pl. 34.) There are several species of this bird, but only one found in England, the length of which is five inches and three quarters long; the upper mandible is black, and the lower white. The tongue is short, horny at the end, and jagged. All the upper parts of the body are of bluish gray; the cheeks and chin are white; the breast and belly pale orange-coloured; and the quills dusky; the tail is short, and consists of twelve feathers, the two middle ones of which are gray, the two outer spotted with white, and the rest dusky. The legs are pale yellow.

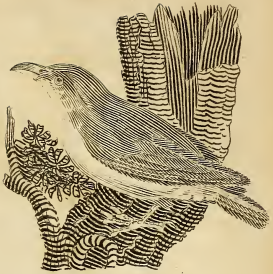
This bird is shy and solitary, frequenting the woods, and running up and down the trees. It often moves its tail like the wagtail. The manners of all the other species very nearly correspond with the European nuthatch; most of them feed on insects, and some of them on hazel nuts.

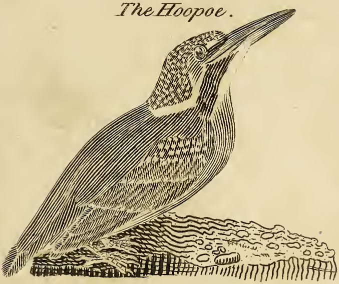
The female deposits her eggs, six or seven in number, in some hole of a tree, frequently in one that has been deserted by the woodpecker, on rotten wood mixed with moss. The nuthatch does not migrate, but in winter approaches nearer inhabited places, and is sometimes seen in orchards and gardens.

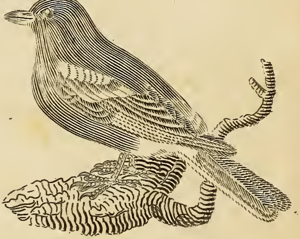
HOOPOE. (*Upupa.* Pl. 34.) The length of this bird is twelve inches, and the breadth nineteen. The bill is above two inches long, black, slender, and somewhat curved; the eyes hazel; the tongue very short and triangular; the head is ornamented with a crest, consisting of a double row of feathers, of a pale orange colour, tipped with black, the highest about two inches in length; the neck is of a pale reddish brown; the breast and belly white, which in the young ones are marked with various dusky lines, pointing downwards; the back, scapular, and wings, are crossed with broad bars of black and white; the lesser coverts of the wings, light brown; the tail consists of ten feathers, each marked white, which when closed, assumes the form of a crescent, the horns pointing downwards: the legs are short and black. There

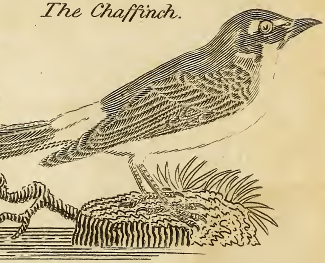
Pl. 34.

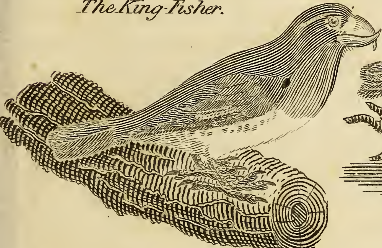

The Hoopoe.

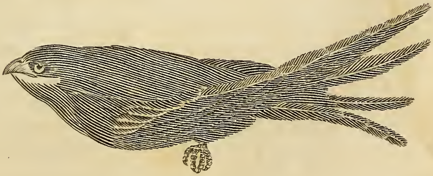

The Nuthatch.


The King-Fisher.


The Chaffinch.


The Wheat-Ear.


The Cross Bill.


The Swift

is only one species of this bird found in England, and even that is not very common, being seen only at uncertain periods.

The female is said to have two or three broods in the year: she makes no nest, but lays her eggs in the hollow of a treee, and sometimes in a hole in a wall, or even on the ground. It is a solitary bird, two of them being seldom seen together. In Egypt, where they are very common, they are seen only in small flocks. Its crest usually falls behind on its neck, except when it is surprised or irritated, and then it stands erect.

CHAFFINCH. (Pl. 34.) The bill is of a pale blue, tipped with black; the eyes hazel; the forehead black; the crown of the head, and the hinder part and sides of the neck are of a bluish ash colour; sides of the head, throat, fore part of the neck, and the breast, are of a vinaceous red; belly, thighs, and vent white, slightly tinged with red; the back is of a reddish brown, changing to green on the rump: both greater and lesser coverts are tipped with white, forming two pretty large bars across the wing; the bastard wing and quill feathers are black, edged with yellow; the tail, which is a little forked, is black, the outermost feather edged with white; the legs are brown. The female wants the red upon the breast; her plumage in general is not so vivid, and inclines to green; in other respects it is not much unlike that of the male.

This beautiful little bird, which is well known in England, begins its short and repeated song early in spring, and continues it till about the middle of summer, after which it is no more heard. The female lays generally five or six eggs, of a pale reddish colour, sprinkled with dark spots, principally at the larger end. The male is very assiduous in his attendance during the time of hatching, seldom straying far from the place, and then only to procure food. Chaffinches subsist chiefly on small seeds of various kinds; they likewise eat caterpillars and insects, with which they also feed their young. They are seldom kept in cages, as their song possesses no variety, and they are not very apt in learning the notes of other birds. The males frequently maintain obstinate combats, and fight till one of them is vanquished, and compelled to give way. In Sweden these birds perform a partial migration; the females collect in large flocks in the latter end of September, and, leaving their mates, spread themselves through various parts of Europe: the males continue in Sweden, and are again joined by their females, who return in great numbers, about the beginning of April, to their wonted haunts.

King Fisher. (*Alcedo Alcyon.* Wil. Pl. 34.) This, which is the most beautiful of all the British birds, is seven inches in length, and eleven in breadth. The bill is near two inches long, and black. The tongue is fleshy, short, flat, and acute. The top of the head and the sides of the body are of a dark green, marked with transverse spots of blue; the tail is of a deep blue, and the other parts of the body are dusky orange, white and black; the legs are red; the wings are short, but they fly very swiftly.

The kingfisher is found throughout Europe. It preys on the smaller fish, and sits frequently on a branch projecting over the current; there it remains motionless, and often watches whole hours to catch the moment when a little fish springs under its station; it dives perpendicularly into the water, where it continues several seconds, and then brings up the fish, which it carries to land, beats to death, and then swallows; but afterwards throws up the indigestible parts.

When this bird cannot find a projecting bough, it sits on some stone near the brink, or even on the gravel; but the moment it perceives the fish, it takes a spring upward of twelve or fifteen feet, and drops perpendicularly from that height. Often it is observed to stop short in its rapid course, and remain stationary, hovering over the same spot for several seconds. Such is its mode in winter, when the muddy swell of the stream, or the thickness of the ice, constrains it to leave the rivers, and ply along the sides of the unfrozen brooks.

This bird lays its eggs, to the number of seven or more, in a hole in the bank of the river or stream that it frequents; the eggs are considerably larger than those of the yellow-hammer, and of a transparent white colour.

WHEAT EAR. (Pl. 34.) This bird weighs upwards of an ounce, and has a slender black bill, about half an inch long: the tongue is cloven or slit, and the inside of the mouth black: the eyes are of an hazel colour, above which there is a pale line passes towards the hinder part of the head: and below them a large black one, which extends itself from the corners of the mouth to the ears. The head and back appear of a cinerious colour, with a mixture of red. The rump is generally white, from whence, by some it has the name of white tail: the belly is white, faintly dashed with red: the breast and throat more deep: the coverts and quills are black, with their extreme edges white, tinctured with a dusky red: the tail is something more than two inches long, and all white.

The wheat-ear visits England annually in the middle of March, and leaves it in September. The females come first, about a fortnight before the males; and continue to come till the middle of May. In some parts of England they are found in vast plenty, and are much esteemed. About Eastbourne, in Sussex, they are taken in snares made of horse-hair, placed beneath a long turf.

Being very timid birds, the motion even of a cloud, or the appearance of a hawk, will immediately drive them into the traps. In England these traps are first set every year on St. James's day, (July 25;) soon after which they are caught in astonishing numbers considering that they are not gregarious, and that more than two or three are scarcely ever seen flying together. The number annually ensnared in the district of Eastbourne alone, is said to amount to nearly two thousand dozen. The birds caught are chiefly young ones, and they are invariably found in the greatest number when an easterly wind prevails.

It is supposed, that the vast quantity of these birds which are found on the downs about Eastbourne, are occasioned by a species of fly, their favourite food, that feeds on the wild thyme, and abounds in the adjacent hills. A few of these birds breed in the old rabbit burrows there. The nest is large, and made of dry grass, rabbit's down, a few feathers, and horse hair. The eggs are from six to eight, and are of a light colour.

Cross Bill. (Pl. 34.) This bird is about the size of a lark, being nearly seven inches in length. It is distinguished by the peculiar formation of its bill, the upper and under coming in opposite directions, and crossing each other at the points. Its eyes are hazel; its general colour reddish, mixed with brown on the upper parts; the under parts are considerably paler, being almost white at the vent; the wings are short, not reaching farther than the setting on of the tail, they are of a brown colour, and somewhat forked; the legs are black. Its colours are extremely subject to variation, both male and female appearing very different at different times of the year.

Notwithstanding the apparent awkwardness of their beaks, they are able, by bringing the mandibles point to point, even to pick up and eat the smallest seeds. This bird, when kept in a cage, has all the actions of a parrot, climbing, by means of his crooked bill, from the lower to the upper bars. It is an inhabitant of the colder climates, and has been found as far as Greenland. It breeds in Russia, Sweden, Poland, and Germany, in the mountains of Switzerland, and among the Alps and Pyrenees, from whence they migrate in vast flocks into other countries. It is sometimes met with in great numbers in England, but its visits are not regular.

The principal food of these birds is said to be the seeds of the pine-tree; the German bird-catchers generally feed them with poppy and other small seed; and they shell hemp-seeds in eating them as well as any other birds whatever. The female begins to build, as early as January, her hemispherical nest in the bare branches of the pine-tree, fixing it with resinous matter which exudes from that tree, and besmearing it on the outside with the same substance, so that melted snow or rain cannot penetrate it. In this she lays a few whitish eggs, spotted towards the thicker end with red. They are rare in this country.

Swift. (*Hirundo*. Pl. 34.) This is the largest of the swallow kind known in these climates, being often eigh-

Indian Bee-Eater.

The Pied Flycatcher.

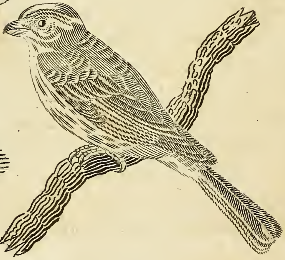
The Parrot.

The Redstart.

The Cockatoo.

The Blackcap.

The Wagtail.


The Yellow-Hammer.

teen inches long, though the entire weight of the bird is not more than one ounce. The whole plumage a sooty black, except the throat, which is white. The feet, which are so small, that the actions of walking and rising from the ground seem very difficult, are of a peculiar structure, all the toes standing forward. It spends more of its time on the wing than any other swallow, and its flight more rapid. It breeds under the eaves of houses, in steeples, and other lofty buildings; and makes its nest of grass and feathers.

The voice of the swift is a harsh scream; yet there are few ears to which it is not pleasing, from an agreeable association of ideas, since it is never heard but in the most lovely summer weather.

These birds retire before the middle of September, generally by the tenth, and not a single straggler is to be seen by the twentieth. This early retreat is totally unaccountable, as that time is often the most delightful in the year. But what is yet more extraordinary, they begin to retire still earlier in the most southerly parts of Andalusia; where they can by no means be influenced by any defect of heat, or even of food. This is one of those incidents in natural history, which not only baffles our researches, but eludes our conjectures, an incident which none but him who supports them can resolve.

INDIAN BEE-EATER. (*Merops.* Pl. 35.) The Indian bee-eater, is about the size of a common blackbird, and has a bill near two inches long, the eyes a fine red; a black stroke is extended to each side of the head, which begins at the corners of the mouth, and passes beyond the eyes. The base of the upper chap, and under the chin, is covered with bright pale blue feathers; the upper and back part of the head, of a dusky yellow; the back and wings of the same colour, only shaded pretty strongly with a green; the tips of the quill-feathers brown, the breast and belly green; the thighs and under part near the vent, of a pale yellow, with a small green mixture. The tail consists of about twelve feathers; the outermost on each side, are of a green and yellow mixture, about three inches in length; the two middlemost twice that length, ending in sharp points, of a brown or dusky colour; the legs and feet black.

They principally feed on bees, beetles, grasshoppers, and other insects. They build in hollow places or caverns three or four cubits deep, and lay six or seven eggs.

Pied Flycatcher. (*Muscicapa.* Pl. 35.) This bird's length is nearly five inches; the bill black; eyes hazel; the forehead is white; the top of the head, the back, and tail are black; the rump is dashed with ash colour; the wing coverts are dusky, the greater coverts are tipped with white; the exterior sides of the secondary quills are white, as are also the outer feathers of the tail; all the under parts, from the bill to the tail, are white; the legs are black. The female is much smaller, but longer tailed than the male; she is brown where he is black; she likewise wants the white spot on the forehead.

They build their nests in holes of trees; the parent birds incessantly feed their young with small flies, which they are very expert in catching.

Parrot. (*Psittacus.* Pl. 35.) The parrot is the best known of all foreign birds, as it unites the most beautiful plumage with the greatest docility. Its voice also is more like a man's than any other; the raven is too hoarse, and the jay and magpie too shrill to resemble the truth: but the parrot's note is of the true pitch, and capable of a variety of modulations.

In their native woods these birds live together in flocks, and generally breed in hollow trees, where they make a round hole for the accommodation of their young; but do not take the trouble of lining it within. They lay two or three eggs, about the size of those of a pigeon, and marked with little specks. The natives are very assiduous in seeking out their nests, and usually take them by cutting down the tree. By this means, indeed, the young parrots are liable to be killed; but if one of them survive it is considered as a sufficient recompence.—The old ones are shot with heavy arrows headed with cotton, which knock them down without killing them.

The facility with which the parrot is taught to speak, and the great number of sentences it is capable of repeating, are equally surprising.—But its agreeable qualities are counterbalanced by the mischievous inclination it has to gnaw whatever it can reach.

The food commonly given to these birds, consists of hemp-seed, nuts, fruit of every kind, and bread soaked in wine; they would prefer meat, but that kind of aliment has been found to make them dull and heavy, and to cause their feathers to drop off after some time. It has been observed, that they keep their food in a kind of pouch, from which they afterwards throw it up in the same manner as ruminating animals.

Redstart. (*Muscicapa Rutticilla.* Wil. Pl. 35.) This bird measures rather more than five inches in length. Its bill and eyes are black; its forehead is white; cheeks, throat, fore part and sides of the neck black, which colour extends over each eye; the crown of the head, hinder part of the neck, and the back are of a deep blue gray; in some subjects, probably old ones, this gray is almost black; its breast, rump, and sides are of a fine glowing red, inclining to orange colour, which extends to all the feathers of the tail, excepting the two middle ones, which are brown; the belly is white; feet and claws black.

The female differs considerably from the male, her colours are not so vivid: the top of the head and back are of a gray ash colour, and the chin is white.

The redstart is migratory; it appears about the middle of April, and departs in the latter end of September, or beginning of October; it frequents old walls and ruinous edifices, where it makes its nest, composed chiefly of moss, lined with hair and feathers. It is distinguished by a peculiar quick shake of its tail from side to side, on its alighting on a wall or other place. Though a wild and timorous bird, it is frequently found in the midst of cities, always chusing the most difficult and inaccessible places for its residence: it likewise builds in forests, in holes of trees; or in high and dangerous precipices. The female lays four or five eggs, not much unlike those of the hedge sparrow, but somewhat longer. These birds feed on flies, spiders, the eggs of ants, small berries, soft fruits, and such like.

Cockatoo. (Pl. 35.) The cockatoo is a beautiful bird of the parrot kind: his plumage is white, his beak round and crooked, and his head is adorned with a crest of long feathers, which is capable of being erected or lowered at pleasure, and gives the bird a most striking fine appearance. It is a native of the Molucca islands and other parts of the East-Indies, where it is frequently known to build on the tops of houses. Like the rest of the parrot kind, it is capable of uttering sea-phrases and sentences, with equal propriety of tone and volubility.

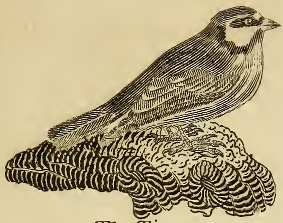
Blackcap. (Pl. 35.) This bird is somewhat above five inches in length. The upper mandible is of a dark horn colour; the under one light blue, and the edges of both whitish: the top of the head black, sides of the head and back of the neck ash-colour; back and wings of an olive gray; the throat and breast are of a silvery gray; belly white; the legs are of a bluish colour, inclining to a brown; the claws black. The head of the female is of a dull rust colour.

The black cap visits England about the middle of April, and retires in September; it frequents gardens, and builds its nest near the ground; it is composed of dried grass, moss, and wool, and lined with hair and feathers. The female lays five eggs, of a pale reddish brown, sprinkled with spots of a darker colour. During the time of incubation the male attends the female, and sits by turns; he likewise procures her food, such as flies, worms, and insects. This bird sings sweetly, and so like the nightingale, that in Norfolk it is called the mock-nightingale.

Black-caps feed chiefly on flies and insects, and not unfrequently on ivy and other berries.

Wagtail. (Pl. 35.) This is a slender bodied bird, that weighs about six drachms, and is about seven inches and a half from the tip of the bill to the end of the tail, and about eleven from the point of each wing, when extended. It has a slender, straight, sharp bill, of a black or dusky colour, upwards of an inch long: the circles of the eyes brown, or hazel-coloured, with a large white spot encircling each eye; and another or two underneath it, on each side of the throat; the top of the head and the

Pl. 36.



The Titmouse.

The Humming-Bird.

The Bird of Paradise.

The Toucan.

The Fern Owl.

fore part of the neck, or throat, and the upper part of the back, are all black. Some of the tips of the quill feathers are white, which form a small white line upon the wing, and another is also formed by the white edges of some of the rows of the covert feathers; the lower parts of the breast and belly are both white. The tail is about three inches long, which is almost continually in motion, wagging up and down, from whence it is supposed to derive the name of wagtail; the outer feathers are chiefly white, the rest black. The claws are sharp-pointed, and pretty long; of a dusky or blackish colour.

These birds are frequently seen about the brinks of rivers, ponds, and small pools of water, and also amongst the low grass in dewy mornings, where they feed upon flies, worms, beetles, and other small insects. They build under the eaves of houses, and in holes in the walls of old buildings; laying four or five eggs.

There is another species, called the wagtail, from the colour of its head, neck, and back. It is somewhat larger than the common wagtail, owing to the great length of its tail. It has a dark brown bill, and over each eye a pale streak; the throat and chin are black, and all the under parts of the body are a bright yellow; the wing-coverts and quills are dark brown, the former with pale edges; the secondaries, which are almost as long as the greater quills, are white at the base; and tipped with yellow on the outer edges; the middle feathers of the tail black, the outer ones white, and the legs are yellowish brown. The female builds her nest on the ground, and sometimes in the banks of rivulets, laying from six to eight eggs, of a dirty white, marked with yellow spots.

The wagtails change their quarters in winter, from the north to the south of England.

Yellow-Hammer. (Pl. 35.) The yellow-hammer is about the size of a sparrow. Its head is of a greenish yellow, spotted with brown: the throat and belly are yellow; the breast and sides, under the wings, mingled with red: the tail flesh colour. These birds build upon the ground, and are common in most parts of England.

Titmouse. (*Parus*. Pl. 36.) The titmouse, which is also called the tomtit, is about four inches and a half in length, and has a straight black bill about half an inch long, pretty thick. The upper part of the head and the chin are black, with a large spot of white beginning at the base of the bill, and passing under the eyes to the sides of the neck; which colour descends as low as the shoulders and middle part of the back, where it appears more shaded with a glossy green; the rump is of a fine blue. The quill feathers have some of their tips white, some blue, others green; the covert-feathers by their white tips make a small transverse white line upon each wing. The breast, belly, and thighs are yellow, with a broad black line passing from the throat down the middle of the breast to the vent. The tail is about two inches and a half long, of a black colour, except the outward edges of some of the feathers which are blue. The legs and feet are a sort of lead colour.

These birds feed on insects, seed, and fruit. They are very prolific, laying eighteen or twenty eggs at a time. Some of them will venture to assault birds that are twice or thrice their own bulk, and in this case they direct their aim chiefly at the eyes. They often seize upon birds that are weaker than themselves; which they kill, and having picked a hole in their skull, eat out their brains. This bird is distinguished above the rest of its kind, by its rancour against the owl.

There are many varieties of this bird; the greater titmouse is about five inches in length. The nest of almost every kind are constructed with the most exquisite art, and with materials of the utmost delicacy; such as moss, hair, and the web of spiders, with which the whole is strongly tied together.

Humming Bird. (*Trochilus*. Pl. 36.) Of this curious little bird there are six or seven varieties, from the size of a small wren down to that of a humble-bee. The smallest humming-bird is about the size of a hazel nut. The feathers on its wings and tail are black; but those on its body and under its wings, are of a greenish brown, with a fine red gloss, which no silk or velvet can imitate. The bill is black and slender, and the head is adorned with a small crest, which sparkles in the sun, like a little star in the middle of the forehead. The larger humming bird, which is nearly half as big as the wren, is without a crest; but to make amends it is covered from the throat half way down the belly, with crimson feathers, and in different lights, change to a variety of different colours. The heads of both are small, with little round eyes, as black as jet.

It is inconceivable how much these little creatures add to the high finishing of a luxuriant western landscape. In the West Indies and South America, as soon as the sun is risen, the humming-birds of different kinds are seen fluttering about the flowers, without ever alighting upon them, their wings are in such rapid motion; visiting flower after flower, and extracting its nectar, as if with a kiss; while the motion of their wings produces a humming sound, which first gave rise to their name.

The nests of these birds, which are about the size of a hen's egg cut in two, are not less curious than the rest: they are suspended in the air, at the point of the twigs of an orange, a pomegranite, or a citron tree; and are composed of cotton, fine moss, and the fibres of vegetables. The female lays two eggs about the size of small peas, and as white as snow, with here and there a yellow speck; and at the end of twelve days the young ones appear. These are at first bare, but are gradually covered with down, and at last with feathers.

Bird of Paradise. (*Paradisœa.* Pl. 36.) This bird has been so called, we may fairly suppose, on account of his being generally seen on the wing, and flying in the tropic zone at a small distance from the land. Its appearance being most welcome to the tired sailor and longing passenger, generally causes much happiness by its foretelling the vicinity of terra firma. The head is small, but adorned with colours which can vie with the brightest nuances of the peacock's embellishments; the neck is of a fawn tint, and the body very small, but covered with long feathers of a browner hue, tinged with gold; two feathers issue from the rump, and constitute the tail. These volatiles, whose beauty exceeds that of all others, are natives of the Molucca islands, and are frequently seen in large flocks among the delightful and spicy woods of that country.

The usual method of taking these birds is by shooting them with reed arrows; after which their legs are amputated, their entrails taken out, and their bodies filled with spices, preparatory for sale to the Europeans.

This bird's feathers is a favourite ornament of the South American ladies.

TOUCAN. (*Ramphastos.* Pl. 36.) This curious bird is almost twenty inches in length: the bill is six inches long, and near two inches thick at the base, being of a yellowish green colour, reddish at the tip. The nostrils are at the base of the bill, but are not covered with feathers, as in some of the species. The principal upper parts of the body, and the breast and neck are of a glossy black, with a tinge of green; the lower part of the back, the rump, upper part of the tail, and small feathers of the wings are the same, with a cast of ash-colour: the breast is of a fine orange. The belly, sides, thighs, and the short feathers of the tail are a bright red; the remainder of the tail is of a greenish black, tipped with red. The legs and claws are black. This bird is easily tamed, and will eat almost any thing offered to it: it generally feeds on fruits.

The toucan builds its nest in the holes of trees, that are either formed by itself, or that from accident it meets with, and lays two eggs; and no bird better secures its young from external injury. It has not only birds, men, and serpents to guard against, but a numerous train of monkies, still more prying, mischievous, and hungry, than all the rest. The toucan, however, sits in its hole, defending the entrance with its great beak; and if the monkey venture to offer a visit of curiosity, the toucan gives him such a welcome, that he is soon glad to escape with safety.

This bird is a native of Guinea and Brazil, and is said to be in great request in South America, both from the delicacy of its flesh, and on account of the beauty of its plumage, particularly the feathers of the breast. The skin of this part the Indians pluck off, and, when dry, glue to their cheeks: they consider these an irresistible addition to their beauty. The female lays two eggs, and it is probable they have more than one brood in the year.

They generally feed on fruits, and are continually moving from place to place in quest of food, going northward or southward, as the fruits ripen. These birds, when in flocks, on retiring to rest, generally appoint one to watch during the night.

Fern Owl. (Pl. 36.) This is a very beautiful bird for colour, and somewhat resembles the cuckoo; it is easily distinguished from all other birds by the structure of its bill and feet. Its bill, in proportion to its body, is the least of all birds, and a little crooked. It has a huge wide mouth and swallow. On the sides of the upper mandible, as also beneath the lower one, is some black hairs, like bristles; the under side of the body is painted with black and red: the legs are very small in proportion, feathered in front half way.

It frequents rocks, caverns, and ruined buildings, and builds its nest, which is constructed in the rudest manner, in the most retired places: it lays five eggs, spotted with white and yellow. It sees better in the day-time than other small birds on the wing; it likewise feeds on mice which it tears to pieces with its bill and claws, and swallows them by morsels: it is said to pluck the birds which it kills before it eats them, in which it differs from all the other owls. It is rarely met with in England: it is sometimes found in Yorkshire, Flintshire, and in the neighbourhood of London.

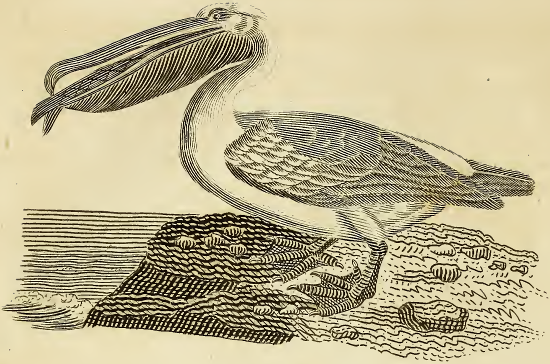
Pelican. (*Pelicanus.* Pl. 37.) All water fowl generally fall under three natural divisions, viz. those of the gull kind, that with long legs and round bills fly along the surface of the water, to seize their prey;—those of the penguin kind, that with round bills, short wings, and legs hid in the abdomen, dive in quest of food;—and, lastly, those of the goose kind, with flat broad bills, that lead harmless lives, and chiefly subsist upon insects and vegetables. In describing the birds of these classes, therefore, we shall put the most remarkable of each at the beginning of their respective tribes, and the more ordinary sorts will naturally follow. We must, however, previously give the history of the above bird, which from the singularity of its conformation, seems allied to no particular species.

The pelican of Africa resembles the swan in shape and colour, but far exceeds it in size. The singularity, however, which distinguishes it from all other birds, is in the bill and the great pouch underneath, which merit a particular description.

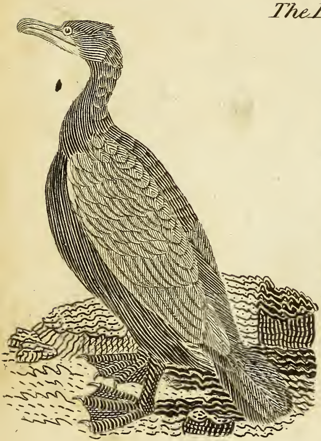
The bill of this bird is fifteen inches long, from the point to the opening of the mouth, which is a good way behind the eyes. It is very thick at the base, where it is of a greenish tint, but tapers off toward the end, which curves downward, and is of a reddish blue. At the lower edge of the under chap hangs a pouch, capable of containing fifteen quarts of water, and reaching the whole length of the bill to the neck: this bag is covered with a very soft and smooth down, and, when empty, is scarcely perceptible, as the bird has the power of wrinkling it up into the lower jaw. This bird was formerly known in Europe, particularly in Russia; but at present it is only found in Africa and America.

The pelican has strong wings furnished with thick plumage of an ash colour, as are the rest of the feathers over the whole body. The eyes are very small, when compared with the size of the head, and there is something in the countenance very sad and melancholy.

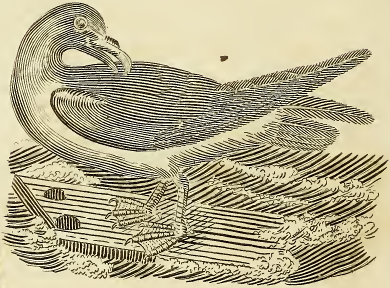
These birds are torpid and inactive to the last degree, so that nothing can exceed their indolence but their gluttony; for were they not excited to labour by the stimulations of hunger, they would always continue in fixed repose. When they have raised themselves about thirty or forty feet above the surface of the sea, they turn their head with one eye downward, and continue to fly in that posture. As soon as they perceive a fish sufficiently near the surface, they dart down with the swiftness of an arrow, seize it with unerring certainty, and store it up in their pouch: they then rise again, and continue hovering



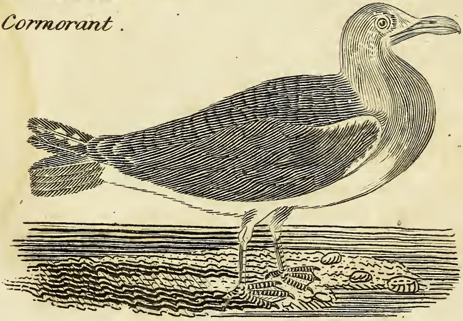
The Pelican.



The Cormorant.



The Fulmar.



The Black and White Gull.

and fishing, till their bag is filled; when they retire to land, and greedily devour the fruits of their industry. Towards night they again feel the stings of hunger, and reluctantly resume their labour; after which they take up their nocturnal abode in some high tree.

The same habits of indolence seem to attend the pelican in every situation; for the female makes no preparation for the duties of incubation, but drops her eggs on the bare ground, to the number of five or six, and there continues to hatch them. Her little progeny, however, seem to call forth some maternal affections: for its young have been taken and tied by the leg to a post, and the parent bird has been observed for several days to come and feed them; remaining with them the greatest part of the day, and spending the night on the branch of a tree that hung over them. By these means they became so familiar that they suffered themselves to be handled: and they very readily accepted whatever fish was given to them. These they always put first into their pouch, and then swallowed them at leisure.

Notwithstanding their natural indolence and stupidity, these birds appear to be susceptible of instruction in a domestic state. For some of them have been known to go off at the word of command, and return with their pouches distended with plunder to their owners.

CORMORANT. (Pl. 37.) This bird is about the size of a Muscovy duck, with the head and neck of a sooty blackness, and the body thick and heavy, more inclining in figure to that of the goose than the gull. Its distinguished character, however, consists in its toes being united by membranes, and by the middle toe being notched, like a saw, to assist it in holding its fishy prey.

On the approach of winter, these birds are seen dispersed along the sea shore, and ascending the mouths of rivers, carrying destruction to all the finny tribe; as they are remarkably voracious, and have such a quick digestion, that their appetite appears completely insatiable. They build their nests on the highest parts of the cliffs that overhang the sea; and the female usually lays three or four eggs, about the size of those of the goose, and of a pale green colour.

In China these birds are said to be bred up tame, for the purpose of fishing, and that one man can easily manage a hundred of them. When a fisherman intends to fish, he carries them out into the lake, perched on the gunnel of his boat, where they continue tranquil, and expect his orders with patience. When arrived at the proper place, each flies a different way, on a given signal, to fulfil the task assigned it: and it is very pleasant on this occasion to behold with what sagacity they portion out the lake or canal where they are upon duty. They hunt about, they plunge, they rise a hundred times to the surface, until they have at last found their prey. They then seize it with their beak by the middle, and carry it to their master. When weary they are suffered to rest for a while, but they are never fed till their work is over. In this manner they supply a very plentiful table; but still their natural voracity cannot be restrained even by education. While they fish, they have always a string fastened round their throats, to prevent them from devouring their prey; as otherwise, they would presently glut themselves, and discontinue their pursuit.

**Fulmar.** (Pl. 37.) This bird is the largest of the petril kind, which is known in the British Isles. It is superior to the size of the common gull, being about fifteen inches in length, and in weight seventeen ounces. The bill is very strong, yellow, and hooked at the end. The head, neck, and all the under parts of the body are white; the back and wings ash coloured, the quills dusky, and the tail white. It feeds on the blubber of whales, which supplies the reservoir, whence it spouts with a constant stock of ammunition. This oil is esteemed by the inhabitants of the north as a sovereign remedy in many complaints both external and internal. The flesh is also considered by them as a delicacy, and the bird is therefore in great request at St. Kilda. It is said that when a whale is taken, these birds will, in defiance of all endeavours, light upon it, and pick out large lumps of fat even while it is alive.

Black and White Gull. (*Larus*. Pl. 37.) This is by far the largest of all the gull-kind, weighing generally upwards of four pounds, and being twenty-five or twenty-six inches, from the point of the bill to the end of the tail; and from the tip of each wing, when extended, five feet and several inches. The bill appears compressed sideways, being more than three inches long, and hooked towards the end, like the rest of this kind, of a sort of orange colour; the nostrils in an oblong form; the mouth wide, with a long tongue and very open gullet.

The irides of the eyes are of a delightful red. The wings, and the middle of the back are black, only the tips of the covert and quill feathers are white. The head, breast, tail, and other parts of the body are likewise white.

The tail is near six inches long, the legs and feet are flesh-coloured, and the claws black. It is a sea fowl, and preys upon fishes, which have been taken whole from its stomach.—There are about twenty varieties of this tribe, which are all distinguished by an angular knob on the chap.

Gulls are found in great plenty in every place; but it is chiefly round the rockiest shores that they are seen in the greatest abundance; it is there that the gull breeds and brings up its young; it is there that millions of them are heard screaming with discordant notes for months together.

These birds, like all others of the rapacious kind, lay but few eggs; and hence, in many places, their number is daily seen to diminish. The lessening of so many rapacious birds may, at first sight, appear a benefit to mankind; but when we consider how many of the natives of our islands are sustained by their flesh, either fresh or salted, we shall find no satisfaction in thinking that these poor people may in time lose their chief support. The gull, in general, as was said, builds on the ledges of rocks, and lays from one egg to three, in a nest formed of long grass and sea-weed. Most of the kind are fishy tasted, with black stringy flesh; yet the young ones are better food; and of these, with several other birds of the penguin kind, the poor inhabitants of our northern islands make their wretched banquets. They have been long used to no other food; and even a salted gull can be relished by those who know no better.

STORMY PETRIL. (*Procellaria Pelagica.* Wil. Pl. 38.) The stormy petril is not larger than a swallow; and its colour is entirely black; except the coverts of the tail, the tail itself, and the vent feathers, which are white. Its legs are long and slender.

It is found in most seas, and frequently at a vast distance from the land, where it braves the utmost fury of the storm, sometimes skimming with incredible velocity along the hollows of the waves, and sometimes over their summits. It is also an excellent diver, and often follows vessels to pick up any thing that is thrown overboard; but its appearance is always looked upon by the sailors as the sure presage of stormy weather in the course of a few hours. It seems to seek protection from the fury of the wind, in the wake of the vessels: and for the same reason it very probably is, that it often flies along between two surges.—The nests of these birds are found in the Orkney Islands, under loose stones, in the months of June and July. They live chiefly on small fish; and although mute by day, are very clamorous during the night.

There are about twenty species of foreign birds of this kind. In the high southern latitudes one is found, which is the size of a goose, and on that account is called the giant petril. The upper parts of its plumage are pale brown, mottled with dusky white; the under parts are white.

GREAT TERN. (*Sterna Hirundo.* Wil. Pl. 38.) This bird is about fourteen inches long, and weighs four ounces and a quarter. The bill and feet are a fine crimson, the former is tipped with black, and very slender. The back of the head is black: the upper part of the body is a pale gray, and the under part white. They have been called sea swallows, from appearing to have all the same actions at sea that the swallow has on land, seizing every insect which appears on the surface, and darting down upon the smaller fishes, which they seize with incredible rapidity.

The lesser tern weighs only two ounces five grains. The bill is yellow, and from the eyes to the bill is a black line: in other respects it almost exactly resembles the preceding.

The black tern is of a middle size between the two preceding species. It weighs two ounces and a half. It receives its name from being all black as far as the vent except a white spot under the throat. This bird is called in some parts the ear swallow. It is very noisy.

GREAT AUK. (*Alca.* Pl. 38.) This bird is the size of a goose; its bill is black, about four inches and a quarter in length, and covered at the base with short velvet like feathers. The upper parts of the plumage are black, and the lower parts white, with a spot of white between the bill and the eyes, and an oblong stripe of the same on the wings, which are too short for flight. It is a very bad walker, but swims and dives well. It is, however observed by seamen, that it is never seen out of soundings, so that its appearance serves as an infallible direction to land. It feeds on the lump-fish, and others of the same size; and it is frequently seen on the coasts of Norway, Greenland, Newfoundland, &c. It lays its eggs close to the sea mark.

There is another bird of this description, called the penguin, which seems to hold the same place in the southern parts of the world, that the auks do in the northern: being only found in the temperate and frigid zones of the southern hemisphere. It resembles the former in almost all its habits: walking erect, and being very stupid: it also resembles it in colour, mode of feeding, and of making its nest. These birds hatch their young in an erect position; and cackle like geese, but in a hoarser tone.

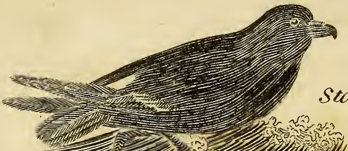
GUILLEMOT. (*Uria.* Pl. 38.) This bird is about the size of a common duck, the upper parts of the body are of a dark brown colour, inclining to a black, except the tips of some of the wing feathers, which are white; all the under parts of the body are also white. The tail is about two inches long.

These are simple birds and easily taken. They generally join companies with other birds, and breed on the inaccessible rocks, and steep cliffs, in the Isle of Man, and likewise in Cornwall; on Prestholm island, near Beaumaris in the isle of Aeglesey; also on the Fern island, near Northumberland, and in the cliffs about Scarborough, in Yorkshire; and several other places in England. They lay exceeding large eggs, being full three inches long, blunt at one end and sharp at the other, of a sort of bluish colour, spotted generally with some black spots or strokes.

The lesser guillemot weighs about sixteen ounces.—The upper parts of its plumage are darker than those of the former species. The black guillemot is entirely black, except a large mark of white on the wings. In winter, however, this bird is said to change to white; and there is a variety in Scotland not uncommon, which is spotted, and which has been described under the name of the spotted Greenland dove. The marbled guillemot, which is found at Kamtschatka, &c. received its name from its plumage, which is dusky, elegantly marked with white.

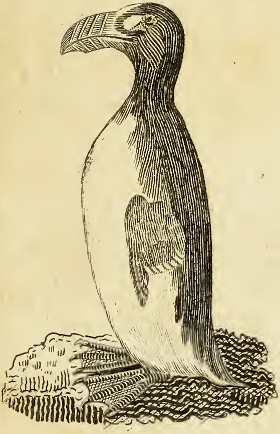
Puffin. (Pl. 38.) The puffin is about twelve inches in length; the eyes are ash-coloured or gray; the upper part of the head and body are black; the lower parts white; it has a sort of black ring that encompasses the throat; the sides of the head are whitish, with a cast of yellow, or ash-colour; the wings are made up of short feathers, and are very small; they fly swift while they keep near the surface of the water, on account of wetting their wings as they proceed. They have black tails, about two inches long; their legs and feet are of an orange colour, and their claws of a dark blue.

The bill is flat: but, very different from that of the duck, its edge is upwards. It is of a triangular figure, and ending in a sharp point; the upper chap bent a little



Stormy Petril.

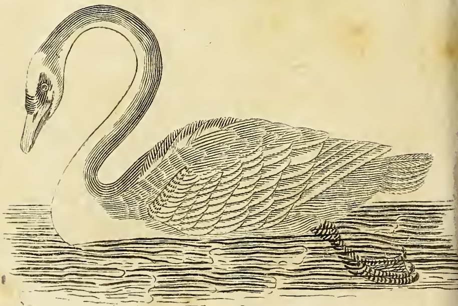
The Great Tern.



The Great Auk

The Guillemot.

The Puffin.



The Swan.

downward, where it is joined to the head: and a certain callous substance encompassing its base, as in parrots.—It is of two colours; ash-coloured near the base; and red towards the point. It has three furrows or grooves impressed in it; one in the livid part, two in the red. The eyes are fenced with a protuberant skin, of a livid colour; and they are gray or ash-coloured.

This bird, like the rest of the auk kind, has its legs thrown so far back, that it can hardly move without tumbling. This makes it rise with difficulty, and subject to many falls before it gets upon the wing; but as it is a small bird, not much bigger than a pigeon, when it once rises, it can continue its flight with great celerity.

The puffin builds no nest: but lays it eggs either in the crevices of rocks, or in holes under ground near the shore. It most generally chooses the latter situation. Relying on its courage, and the strength of its bill, with which it bites most keenly, it either makes or finds a hole in the ground, where to lay or bring forth its young. The males perform the office of sitting, and relieving their mates when they go to feed. The young are hatched in the beginning of July. When the young one is excluded, the parent's industry and courage are incredible. Few birds or beasts will venture to attack them in their retreats. When the great sea-raven, comes to take away their young, the puffins boldly oppose him. Their meeting affords a most singular combat. As soon as the raven approaches, the puffin catches him under the throat with its beak, and sticks its claws into his breast, which makes the raven with a loud screaming, attempt to get away; but the little bird still holds fast to the invader, nor lets him go till they both come to the sea, where they drop down together, and the raven is drowned; yet the raven is but too often successful, by invading the puffin at the bottom of its hole, and so devouring the puffin and its family.

Swan. (Pl. 38.) So much difference is there between this bird when on land and in the water, that it is hardly to be supposed the same, for in the latter, no bird can possibly exceed it for beauty and grandeur. When it ascends from its favourite element, its motions are awkward, and its neck is stretched forward with an air of stupidity; but when seen smoothly sailing along the water, commanding a thousand graceful attitudes, and moving at pleasure without the smallest effort, there is not a more beautiful figure in all nature. In the exhibition of its form, there are no broken or harsh lines; no constrained or catching motions; but the soundest contours, and the easiest transitions; the eye wanders over every part with insatiable pleasure, and every part takes a new grace with a new motion. It will swim faster than a man can walk.

This bird has long been rendered domestic; and it is now a doubt whether there be any of the kind in a state of nature. The colour of the tame swan is entirely white, and it generally weighs full twenty pounds. The windpipe sinks down into the lungs in the ordinary manner; and it is the most silent of all the feathered tribes: it can do nothing more than hiss, which it does on receiving any provocation. In these respects it is very different from the wild or whistling swan.

This beautiful bird is as delicate in its appetites, as elegant in its form. Its chief food is corn, bread, herbs growing in the water, and roots and seeds, which are found near the margin. At the time of incubation it prepares a nest in some retired part of the bank, and chiefly where there is an islet in the stream. This is composed of water-plants, long grass, and sticks; and the male and female assist in forming it with great assiduity. The swan lays seven or eight eggs, white, one per day, much larger than those of a goose, with a hard, and sometimes a tuberous shell. It sits near two months before its young are excluded; which are ash coloured when they first leave the shell, and for some months after. It is not a little dangerous to approach the old ones, when their little family are feeding round them. Their fears, as well as their pride, seem to take the alarm, and when in danger, the old birds carry off the young ones on their back.

Swans were formerly held in such great esteem in England, that, by an act of Edward the fourth, none, except the son of the king, was permitted to keep a swan, unless possessed of five marks a year. By a subsequent act, the punishment for taking their eggs was imprisonment for a year and a day, and a fine at the king's will. At present they are but little valued for the delicacy of their flesh; but numbers are still preserved for their beauty. Many may be seen on the Thames, where they are esteemed royal property, and it is accounted felony to steal their eggs.

Goose. (Pl. 39.) The common tame goose is nothing more than the wild goose in a state of domestication. It is sometimes found white, though much more frequently verging to gray; and it is a dispute among men of taste, which should have the preference.

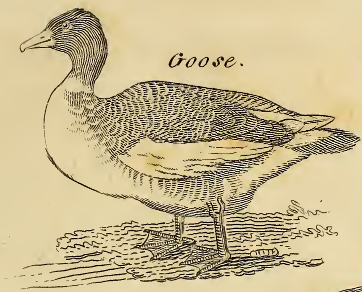
These birds in rural economy, are an object of attention and profit, and are no where kept in such vast quantities as in the fens of Lincolnshire; several persons there having as many as a thousand breeders. They are bred for the sake of their quills and feathers; for which they are stript while alive, once in the year for their quills, and no less than five times for the feathers: the first plucking commences about Lady-day, for both; and the other four between Lady-day and Michaelmas. It is said that in general the birds do not suffer much from this operation, except cold weather sets in, which then kills great numbers of them. The old geese submit quietly to be plucked, but the young ones are very noisy and unruly. The possessors, except in this cruel practice, treat their birds with kindness, lodging them very often even in the same room with themselves.

These geese breed in general only once a year, but if well kept they sometimes hatch twice in a season. During their sitting, each bird has a space allotted to it, in rows of wicker pens placed one above another; and it is said that the gozzard, or goose herd, who has the care of them, drives the whole flock to water twice a day, and bringing them back to their habitations, places every bird in its own nest.

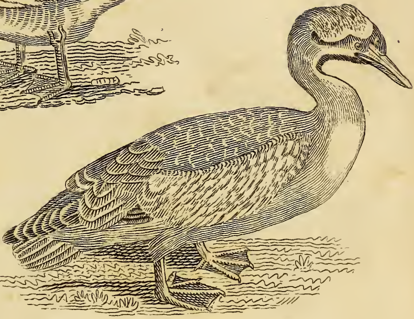
Gannet. (Pl. 39.) This bird, which is about the size of a tame goose, is somewhat more than three feet in length, and weighs about seven pounds. The bill is six inches long, straight almost to the point, where it is a little bent; its edges are irregularly jagged, for the better securing of its prey; and about an inch from the base of the upper mandible, is a sharp process, pointing forward. The general colour of the plumage is dirty white, with a cinereous tinge. Surrounding each eye, there is a naked skin of fine blue: from the corner of the mouth a narrow slip of naked black skin extends to the hind part of the head; and beneath the coin is a pouch, like that of the pelican, capable of containing five or six herrings. The neck is long; the body flat, and very full of feathers. On the crown of the head, and the back part of the neck, is a small buff-coloured space. The quill feathers, and some other parts of the wings are black; as are also the legs, except a fine pea-green stripe in their front. The tail is wedge-shaped, and consi [illegible] twelve sharp-pointed feathers.

These birds, which subsist entirely upon fish, chiefly resort to those uninhabited islands where their food is found in plenty, and men seldom come to disturb them. The islands to the north of Scotland, the Skelig islands of the coasts of Kerry, in Ireland, and those that lie in the north sea of Norway, abound with them. But it is on the Boss island, in the Firth of Edinburgh, where they are seen in the greatest abundance.

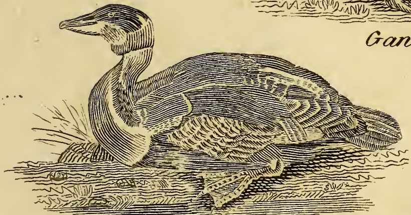
The gannet is a bird of passage. In winter it seeks the more southern coasts of Cornwall, hovering over the shoals of herrings and pilchards which then come down from the northern sea: its first appearance in the northern islands is at the beginning of spring: and it continues to breed till the end of summer. But, in general, its motions are determined by the migrations of the immense shoal of herrings that come pouring down at that season through the British channel, and supply all Europe, as well as this bird, with their spoil. The gannet assidu-



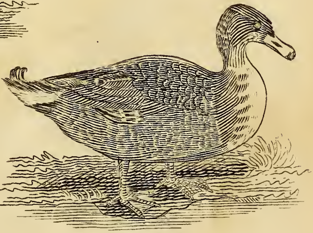
Goose.



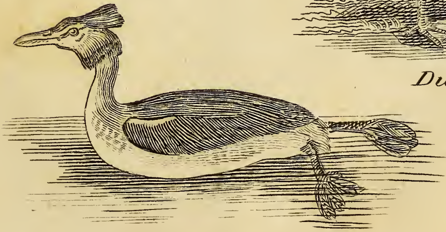
Gannet.



Eider Duck.



Duck.



Crested Diver.

ously attends the shoal in their passage, keeps with them in their whole circuit round Great Britain, and shares with the fishermen this exhaustless banquet. As it is strong of wing, it never comes near the land, but is constant to its prey. Wherever this bird is seen, it is sure to announce to the fishermen the arrival of the finny tribe; they then prepare their nets, and take the herrings by millions at a draught; while the informer comes, though an unbidden guest, and snatches its prey from the fisherman even in his boat. While the fishing season continues, the gannets are busily employed: but when the pilchards disappear from the coasts, they take their leave to keep them company.

These birds breed but once a year, and lay only one egg, but if that be taken away, they lay another; and if that be also taken away, then a third; but never more for that season. Their eggs are white, and rather less than those of the common goose; and their nest large, composed of such substances as are found floating on the surface of the sea. The young birds during the first year, differ greatly in colour from the old ones; being of a dusky hue, speckled with numerous triangular white spots.

These birds, when they pass from place to place, unite in small flocks of from five to fifteen; and, except in very fine weather, fly low, near the shore, but never pass over it; doubling the capes and projecting parts, and keeping nearly at an equal distance from the land. During their fishing they rise high into the air, and sail aloft over the shoals of herrings or pilchards, much in the manner of kites. When they observe the shoal crowded thick together, they close their wings to their sides, and precipitate themselves head foremost into the water, dropping almost like a stone. Their eye in this act is so correct, that they never fail to rise with a fish in their mouth.— If in flying away with one, they see another they like better, they immediately drop the first to regain it.

EIDER DUCK. (*Anas Mollissima.* Lath. Pl. 39.) The eider duck is about twice the size of the common English duck. Its bill is black and cylindrical; the feathers of the forehead and cheeks advance far into the base. In the male, the feathers of part of the head, the lower part of the breast, the belly, and the tail, are black, as are also the quill feathers of the wings; and nearly all the rest of the body is white. The legs are green. The female is of a reddish brown, variously marked with black and dusky streaks. It is principally found in the western isles of Scotland, on the coasts of Norway, Iceland, and Greenland, and in many parts of North America, particularly in the Esquimaux islands.

In Iceland the eider ducks generally build their nests on small islands not far from the shore: and sometimes even near the dwellings of the natives, who treat them with so much attention and kindness as to render them nearly tame. Sometimes two females will lay their eggs in the same nest, in which case they always agree remarkably well. The female lays from three to five eggs (sometimes so many as eight) which are large, smooth, glossy, and of a pale olive colour. They generally lay among stones, or plants, near the sea, but in a soft bed of down, which they pluck from their own breasts.

As long as the female is sitting, the male continues on watch near the shore; but as soon as the young are hatched, he leaves them. The mother, however, remains with them a considerable time afterwards. It is curious to observe her manner of leading them out of the nest, almost as soon as they creep from the eggs. Going before them to the shore, they trip after her: and, when she comes to the water side, she takes them on her back, and swims a few yards with them, when she dives; and the young ones are left floating on the surface, obliged to take care of themselves. They are seldom afterwards seen on land.

From these birds is produced the soft down so well known by the name of eider, or edder-down, with which they line the inside of their nests, which render them particularly warm. When the natives come to the nest, they carefully remove the female and take away the superfluous down and eggs; after this, they replace the female: she then begins to lay afresh, and covers her eggs with new down, which she also plucks from her body; when this is scarce, or she has no more left, the male comes to her assistance, and covers the eggs with his down, which is white, and easily distinguished from that of the female. When the young ones leave the nest, which is about an hour after they are hatched, it is once more plundered.—The most eggs and the best down, are got during the first three weeks of their laying; and it has generally been observed, that they lay the greatest number of eggs in rainy weather. One female, during the time of laying, generally gives half a pound of down; which, however, is reduced one half after it is cleaned.

The Greenlanders kill these birds with darts; pursuing them in their little boats, watching their course by the air bubbles when they dive, and always striking them when they rise to the surface wearied. The flesh is valued as food, and their skins are made into warm and comfortable under garments.

Duck. (Pl. 39.) The common duck, of which there are about ten different sorts, is so universally known as to require no description. It is most easily reared of all our domestic animals. The very instinct of the young ones directs them to their favourite element, and though they are conducted by a hen, they despise the admonition of their leader. The feet of the tame duck are black.

It is usual to lay duck eggs under a hen, because she hatches them better than the original parent would have done. The duck seems to be a heedless, inattentive mother; she frequently leaves her eggs till they spoil, and even seems to forget that she is entrusted with the charge: she is equally regardless of them when excluded; she leads them to the pond, and thinks she has sufficiently provided for her offspring when she has shown them the water. Whatever advantages may be procured by comming near the house, or attending in the yard, she declines them all; and often lets the vermin, who haunt the waters destroy them, rather than take shelter nearer home. The hen is a nurse of a very opposite character; she broods with the utmost assiduity, and generally brings forth a young one from every egg committed to her charge; she does not lead them to the water indeed, but she carefully guards them when there, by standing at the brink.—Should the rat or the weazel attempt to seize them, the hen instantly gives them protection; she leads them to the house when tired with paddling, and rears up the suppositious brood without ever suspecting that they belong to another.

Crested Diver. (Pl. 39.) The crested diver is about the size of a duck; the bill, that part especially towards the head is of a reddish colour, and in length is somewhat more than two inches; on the top of the head and neck, is a beautiful crest of feathers, those on the neck appearing like a collar or ruff, and seem a good deal bigger than they really are; those on the top of the head are black, those on the sides of the neck, are of a reddish or cinereous colour; the back and wings are of a darkish brown, pretty much inclining to black, except some of the exterior edges of the wing feathers, which are white. The breast and belly are of a light ash-colour; it has no tail; the legs and toes broad and flat, much like those before described. It has an unpleasant cry; and will occasionally, when angered or pleased, raise or fall the feathers of its crest.

Widgeon. (Pl. 40.) This bird weighs near a pound and a half; it has a black nail at the end of the upper mandible of the bill, the other part of which is of a lead colour; the structure of the head and mouth very much resembles the common wild duck, only the head does not seem to be quite so large, in proportion to the body, which also appears of a finer shape, and the wings longer. The crown of the head towards the base of the bill, is of a pale pink colour, inclining to a reddish white; the other parts of the head and neck are red; the sides of the body and the upper part of the breast, are tinctured with a very fair, glossy, and beautiful claret colour, with a few small transverse lines of black. The feathers on the back are brown, the edges more pale or ash coloured; the scapular feathers, and those under the fore part of the wings, are finely variegated with small transverse black and white lines, beautifully dispersed like waves; the quill-feathers are some of them brown, with white tips, others have their outward webs of a blackish purple; other parts, especially those beyond the covert feathers, of a lovely fine blue; some of the exterior feathers have their outward webs inclining to black, with a fine purple gloss, upon the borders of which there are a number of small light coloured spots; the rest of the wing feathers are of a beautiful party-coloured brown and white. The upper part of the tail is ash-coloured; the under part behind the vent, black. The legs and feet of a dark lead colour, and the claws black.

Widgeons are common in Cambridgeshire, the isle of Ely, &c. where the male is called the widgeon, and the female the whewer. They feed upon wild periwinkles, grass, weeds, &c. which grow at the bottom of rivers and lakes. Their flesh has a very delicious taste, not inferior to teal, or wild ducks.

Smew. (*Mergus Albellus*. Pl. 40.) This bird measures from the point of the bill to the end of the tail near eighteen inches, and from the extremity of each wing when extended, upwards of two feet, and weighs about a pound and a half. It has a fine crest upon the head, which falls down towards the back part of it, under which, on each side of the head, is a black spot: the rest of the head and neck are white, as is the under parts of the body; the back and the wings are of an agreeable mixture, of black and white. The tail is about three inches long, of a sort of dusky ash-colour, the feathers on each side shortening gradually. The bill is of a lead colour, at the extremity of which is a dirty coloured spot of white; it is somewhat less than the generality of the duck kind, a little hooked, with large open nostrils, and darkish coloured eyes; the legs are pretty much of the same colour of the bill.

The female of this bird has no crest; the sides of the head are red, the throat white, the wings of a dusky ash-colour; in other respects it agrees with the male. They feed on fish, but are very rarely seen in England, except in very hard seasons, and then not more than three or four of them together.

TEAL. (Pl. 40.) This is the smallest bird of the duck-kind, and does not usually weigh more than twelve or fourteen ounces: it is about sixteen inches from the point of the bill to the end of the tail, and from the extremity of each wing, when extended, near two feet. The bill is of a dark brown colour, the head is considerably lighter, inclining to a bay, with a large white stripe over each eye, bending downwards, towards the back part of the head: the neck, back, and tail, are of a more dusky colour. The breast is of a dirty coloured yellow, interspersed with dusky transverse lines: the belly more bright, with yellowish brown spots: the quill-feathers of the wings are of a dusky brown, with white edges; the covert-feathers appear of a fine shining green, with their tips white; the scapular feathers are more inclining to an ash-colour; the legs and feet are brown, the claws black. These birds feed on water plants, seeds and grass.

The Chinese teal of Edwards, and the summer duck of Catesby, are elegant species; the former is a native of China, sometimes brought alive into England, but too tender to be reared in that country. The other inhabits Mexico and some of the West-India islands; and is to be seen at times in the menageries of the curious.

CRANE. (Pl. 40.) Birds of this species may, for the most part, be distinguished by the length of their legs and bills, the latter of which are possessed of great sensibility near the point, and even furnished with nerves, for the better feeling their food at the bottom of marshes, where it cannot be seen. None of them have been taken under the protection of man; but they lead a life of precarious liberty, in fens and marshes, at the edges of lakes, and along the sea-shore. These cannot strictly speaking, be called either land-birds, or water-fowl; as they derive all their sustenance from watery places, and yet are unqualified to seek it in those depths where it is found in greatest plenty.

The above bird measures about three feet and a quarter in length and three feet in height, with a neck proportioned to the length of it legs. The top of the head is covered with black bristles, and the back of it, which is bald and of a red colour, distinguishes it from the stork, to which it would otherwise bear a very near resemblance. The plumage is generally ash-coloured, and from the pinion of each wing, grow two large tufts of feathers finely curled at the ends; which the bird can erect or depress at pleasure.

The arctic regions seem to be the favourite abode of these birds: for although they are found in most parts of Europe, except Great Britain, they may be considered as visitants rather than inhabitants; as they migrate from one part to another, and seem to follow the seasons. As they rise but heavily, they are extremely shy, and seldom let the fowler approach them. Their depredations are usually made at night, when they will enter a field of corn, and trample it down, as if it had been crossed over by a regiment of soldiers. On other occasions they choose some extensive solitary marsh, where they range themselves all day, as if they were in deliberation: and, not finding that gain which is most suitable to their appetites, they wade the marshes for insects and other food, which they can procure with less difficulty and danger. The female lays two eggs about the size of those of a goose, but of a bluish colour. The young ones may be easily domesticated, which experience has proved.

Gigantic Crane. (*Ardea Hurgil.* Ives. Pl. 40.) This bird is much larger than the former, measuring from tip to tip of the wings nearly fifteen feet. The bill is of a vast size, nearly triangular, and sixteen inches round at the base. The head and neck are naked, except a few straggling curled hairs. The feathers of the back and wings are of a bluish ash colour, and very stout; those of the breast are long. The craw hangs down the fore part of the neck like a pouch. The belly is covered with a dirty white down, and the upper part of the back and shoulders are surrounded with the same. The legs and half the thighs are naked: and the naked parts are full three feet in length.

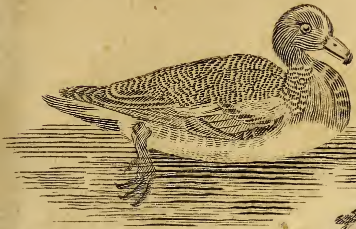
This bird is an inhabitant of Bengal and Calcutta, and is sometimes found on the coast of Guinea. It arrives in the internal parts of Bengal before the period of the rains, and retires as soon as the dry season commences. Its aspect is filthy and disgusting, yet it is one of the most useful birds of these countries, in clearing them of snakes and noxious reptiles and insects. It seems to finish the work begun by the jackall and vulture: they clearing away the flesh of animals, and these birds removing the bones by swallowing them entire. They sometimes feed on fish: and one of them will generally devour as much as would serve four men.

Gigantic cranes are found in companies; and when seen at a distance, near the mouths of rivers, coming towards an observer (which they do with their wings extended), it is said that they may easily be mistaken for canoes on the surface of a smooth sea: and when on the sand banks, for men and women picking up shell fish on the beach.

STORK. (*Ciconia.* Ray. Pl. 40.) Of this bird we shall confine ourselves to the most remarkable species, which is the white stork, the length of which is about three feet. The bill is nearly eight inches long, and of a fine red colour. The plumage is wholly white, except the orbits of the eyes, which are bare and blackish: some of the feathers on the side of the back and on the wings are black. The skin, the legs, and the bare parts of the thighs, are red.

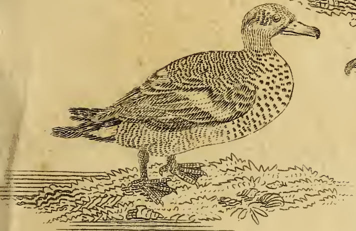
The white stork is semi-domestic; haunting towns and cities, and in many places stalking unconcernedly about the streets, in search of offal and other food. They remove the noxious filth, and clear the fields of serpents and reptiles. On this account they are protected in Holland, and held in high veneration by the Mahometans; and so greatly were they respected in times of old by the Thessalonians, that to kill one of these birds was a crime expiable only by death.

The disposition of this bird is mild, neither shy nor savage: it is easily tamed, and may be trained to reside in gardens, which it will clear of insects and reptiles.



Widgeon.

Smew.



Teal.

Crane.

Gigantic Crane.

Stork.

Pl. 41.

Heron.

Flamingo.

Bittern.

Cushew Bird.

Spoonbill.

It has a grave air, and a mournful visage: yet, when roused by example, it shews a certain degree of gaiety, for it joins the frolics of children, by imitating them.

Storks are birds of passage, and observe great exactness in the time of their autumnal departure from Europe, to more favourite climates. They are seldom seen farther north than Sweden: and though they have scarcely ever been met with in England, they are so common in Holland as to build every where on the tops of houses, where the good-natured inhabitants provide boxes for them to make their nests in; and are careful that the birds suffer no injury, always resenting this as an offence committed against themselves. Storks are also common at Aleppo, and in plenty at Seville, in Spain. At Bagdad, hundreds are said to be seen about the houses, walls, and trees; and at Persepolis, or Chilmanar, in Persia, the remains of the pillars serve them to build on, every pillar having a nest on it.

This bird bestows much time and care on the education of its young, and does not leave them till they have strength sufficient for defence and support When they begin to flutter out of the nest, the mother bears them on her wings; she protects them from danger, and will sometimes perish rather than forsake them.

In autumn they retire into Egypt, and the marshes of Barbary, where they enjoy a second summer, and bring up a second brood.

Heron. (*Ardea.* Pl. 41.) This bird is remarkably light in proportion to its bulk; seldom weighing more than three pounds and a half, although it expands a breadth of wing not less than five feet. Its bill is five inches long from the base to the point; and its claws are long, sharp, and formidable: but though it appears thus completely armed for war, it is indolent and cowardly, and even flies at the approach of a sparrow-hawk. In fresh water, however it is a perfect tyrant, and there is scarcely a fish, however large, that it will not strike at and wound, though unable to carry it away: but it subsists chiefly on the smaller fry, of which it devours immense quantities.

These birds live chiefly among pools and marshes, and commit their depredations in solitude and silence; yet in making their nests they are seen; like rooks, building in company with flocks of their own kind. Their nests are made of sticks, and lined with wool; and the female lays four large eggs of a pale greenish colour. When the young are excluded, as they are numerous, voracious, and importunate, the parents are forever on the wing, to satisfy their cravings; and the quantity of fish they take upon this occasion is truly surprising.

This bird, though he usually takes his prey by wading into the water, frequently also catches it while on the wing: but this is only in shallow waters, where he is able to dart with more certainty than in the deeps; for in this case, though the fish does, at the first sight of his enemy, descend, yet the heron, with his long bill and legs, instantly pins it to the bottom, and thus seizes it securely.

BITTERN. (*Stellaris*. Pl. 41.) It is impossible for words to convey an adequate idea of the terrific solemnity of the bittern's evening call, which resembles the interrupted bellowing of a bull, but is louder, and may be heard at a greater distance. The bird however, from which it proceeds, is less than the heron, and neither so voracious nor destructive. Its plumage is of a pale yellow colour, spotted and barred with black, and its flesh is esteemed a great dainty.

The bittern is naturally a timid and inoffensive bird, concealing itself by day, in the midst of reeds and marshy places, and subsisting upon frogs, insects, and vegetables. At the latter end of autumn, however, in the evening, its usual indolence seems to forsake it, and it is then seen rising in a spiral ascent till it is quite lost from the view, making, at the same time, a singular noise, very different from its former boomings.—The female composes a simple nest of sedges, the leaves of water plants, and dry rushes; and generally lays seven or eight eggs; of an ash-green colour.

When wounded by the sportsman, this bird often makes a severe resistance. It does not retire; but waits the onset, and gives such vigorous pushes with its bill, as to wound the leg through the boot. Sometimes it turns on its back, like rapacious birds, and fights with both its bill and claws. When surprised by a dog, it is said always to throw itself in this posture, and defend itself so vigorously, as to compel its antagonist to retire.

Flamingo. (*Phoenicopterus Ruber*. Lath. Pl. 41.) The flamingo is the tallest, largest, and most beautiful bird of the crane kind. The body, which is of a bright scarlet, is about the size of that of a large swan; the wings extended are five feet six inches from tip to tip; and the neck is nearly three feet long. The head is round and small and furnished with a long bill, partly red and partly black. The legs and thighs are remarkably slender, and the toes are united by membranes, like those of a goose, though the animal has never been seen in the act of swimming.

When seen in the day-time, these birds always appear drawn up in a long close line of two or three hundred together, and present, at the distance of half a mile, the exact representation of a long brick wall. When they break their ranks to search for food, one of them is always employed as a centinel, who sounds an alarm on the remotest appearance of danger.

The female builds her nest in extensive marshes, where there is no danger of a surprise; and the fabric is not less curious than the bird that erects it. It is raised about eighteen inches above the surface of the pool, and is formed of mud, scraped together and hardened in the sun; its shape resembles that of a common chimney-pot; the upper part is hollowed out to the shape of the bird; and in that cavity she lays her eggs, which never exceed two in number. The young ones are for a long time incapable of flying, but they are said to run with amazing celerity. They may be easily domesticated; but generally pine away for want of their natural supplies.

Cushew Bird. (Pl. 41.) This bird's natural size, is nearly that of a hen-turkey. It has its name from the knob over its bill, which, in shape, greatly resembles the cushew nut of America. It is a native of the torrid zone, and is found in Jamaica, and other islands of America. It feeds, like the turkey, on grain insects, and the like.

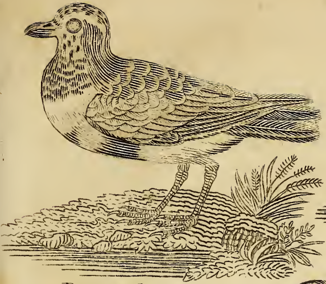
The knob over the bill is of a fine blue colour, as is also the basis of the upper mandible of the bill; the remainder of the bill is red: the eyes have reddish brown irides. The whole bird is of a shining blackish colour, reflecting purple glosses; except the lower part of the belly, the covert feathers, under the tail, and the tips of the tail feathers, which are white. The legs and feet are covered with a scaly skin, of a bright flesh-colour.

SPOONBILL. (*Platalea.* Pl. 41.) The spoonbill, or shoveller, is about the size of the crane, but not quite so tall. The common colour of those of Europe is a dirty white, but in America they are seen of a beautiful rose colour or a delightful crimson. Beauty of plumage seems to be the prerogative of all the birds of that continent; and we here see the most splendid tints bestowed on an animal whose figure is sufficient to destroy the effects of its colouring; for its bill is so oddly fashioned, and its eye so stupidly staring, that its plumage only tends to add splendor to deformity.

The spoonbill chiefly subsists on frogs, toads, and serpents, of which it destroys great numbers; and it is for that reason highly esteemed by the inhabitants of the Cape of Good Hope. The female lays from three to five eggs, and in Europe, its nest is usually found in high trees, near that of the heron, and constructed of the same materials. The inhabitants who claim the trees they build in, furnish themselves with a long pole hooked at the end, with which they shake out the young ones; but sometimes the nest and all tumble down together.

On the hind part of the head of this bird is a beautiful white crest, reclining backward; while the legs and thighs are jet black: but the wisdom of Providence is conspicuous in the conformation of the bill, which seems entirely adapted to the habits and manner of feeding of these birds; the frog and the lizard, which constitute the principal food of the spoonbill; do often escape the thin and narrow beak of the heron and others, but here the

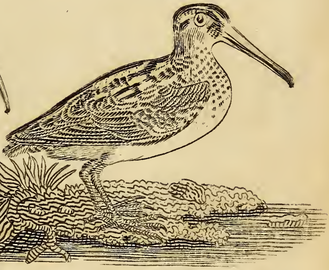
Pl. 42.



Dotterel.

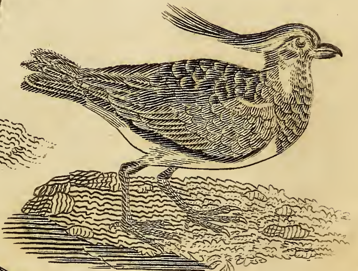
Godwit.

Curlew.

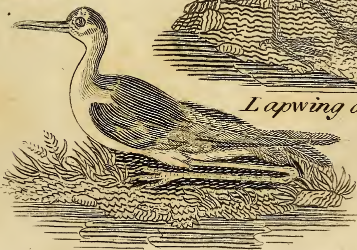


Snipe.

Woodcock.



Lapwing or Pee-Wit.



Long-Legged Plover.

mandibles are so large at the end, that the prey cannot slip aside.

DOTTEREL. (Pl. 42.) The length of this bird is about nine inches. Its bill is black; the cheeks and throat are white; the back and wings are of a light brown, inclining to olive, the breast is of a dull orange; the belly, thighs, and vent, are of a reddish white; the tail is an olive brown, and tipped with white: the legs are of a dark olive colour.

The dotterel is common in various parts of Great Britain, though in some places it is scarcely known. They are supposed to breed in the mountains of Cumberland and Westmoreland, where they are sometimes seen in the month of May, during the breeding season; they likewise breed on several of the Highland hills: they are very common in Cambridge, Linconshire, and Derbyshire, appearing in small flocks on the heath and moors of those countries during the months of May and June, and are then very fat, and much esteemed for the table.

AVOSETTA. (*Recurvirostea.* Lath.) The avosetta is about the size of a pigeon, and has extreme long legs; but the most extraordinary part of its figure is the bill, which turns up like a hook, in an opposite direction to that of the hawk or the parrot; this is of a black colour, flat, sharp, and flexible at the end.

These birds commonly breed in the fens of Lincolnshire, and on Romney marsh, in Kent, (England.) In winter they assemble in flocks of six or seven about the mouths of large muddy rivers, in search of worms and insects, which they scoop out of the mud, with their recurved bills. Their feet seem calculated for swimming, but, as they are never observed to take the water, it is probable that they are furnished with a web merely to prevent their sinking in the mud. The female lays two eggs, of a white colour tinged with green, and marked with black spots.

GODWIT. (Pl. 43.) The godwit is about sixteen inches in length: the bill is near as long as that of the woodcock, of a palish red towards the base, and black at the point; the upper mandible something longer than the lower, the tongue is sharp, the ears open, and large. The feathers upon the head are a light brown or reddish colour, with their middle parts black, but about the eyes of a more pale or yellowish tincture; the neck and breast are pretty much of the same colour with the head, only dispersed with transversed black lines, edged with a pale yellow. The tail feathers are alternately crossed with black and white lines. The legs of a dusky greenish colour, and the claws black.

They feed by the sea-side upon sandy shores; down like the gull. The throat and neck of the hen is gray, and the rump white, speckled or powdered with blackish spots. They are in some places called the stone plover.

CURLEW. (*Numenius*. Pl. 42.) There are eleven species of this bird, differing very much in size, the longest measuring about twenty-five inches, and sometimes weighing thirty-six ounces. These birds fly in considerable flocks, and are well known upon the sea coasts in most parts, where, and in the marshes they frequent in winter, they feed on worms, frogs, and all kinds of marine insects. In April, or the beginning of May, they retire into mountainous and unfrequented parts of the sea shore, where they breed, and do not return again till the approach of winter. There have been some advocates in favour of the flesh of this bird, but in general it is strong and fishy. It has a long black bill, much curved or arched, about eight fingers long, and beginning to bend a little downwards about three inches from the head. The middle parts of the feathers on the head, neck and back, are black; the borders or outsides ash coloured, with an intermixture of red; and those between the wings and back are of a most beautiful glossy blue, and shine like silk. The vent and belly are white. The feet are divided, but joined by a little membrane at the root. The tongue is very short, considering the length of the bill, and bears some resemblance to an arrow.

The female is somewhat larger than the male, which is commonly called the jack curlew, and the spots with which her body is covered almost all over, is more inclining to a red.

Snipe. (*Scolopax.* Pl. 42.) This bird measures from the point of the bill to the end of the tail, about twelve inches, and from the point of each wing, when extended, about fifteen or sixteen; the head is divided by a pale and red line, which runs longways, parallel to which on each side is a black line, and over the eyes there runs another line pretty much of the same colour as that on the middle of the head; it has a white place under the bill. The feathers that spring from the shoulders are so long that they reach almost as far as the end of the tail, the outward half from the shaft being of a pale red. The colours thus succeeding each other, make two lines down the back, the covert feathers of which are dusky with white transverse lines, and white tips on some of the large wing feathers, the lesser feathers being of a mixed colour of red, black, and gray, beautifully variegated with white and brown lines running across them. The bill is black at the tip, and near three inches long, the tongue is sharp, the eyes of a hazel colour. The legs are of a pale greenish colour, the toes pretty long, and the talons black.

There are two sorts, but they frequent the same places, subsist on the same food, and are frequently found near to each other. The larger is called the whole snipe, and the smaller the jack.

The flesh is exceedingly good, sweet, and tender; it feeds in drains of water springs, and other fenny places, on worms and other insects, and upon the fat unctious humour that it sucks out of the earth.

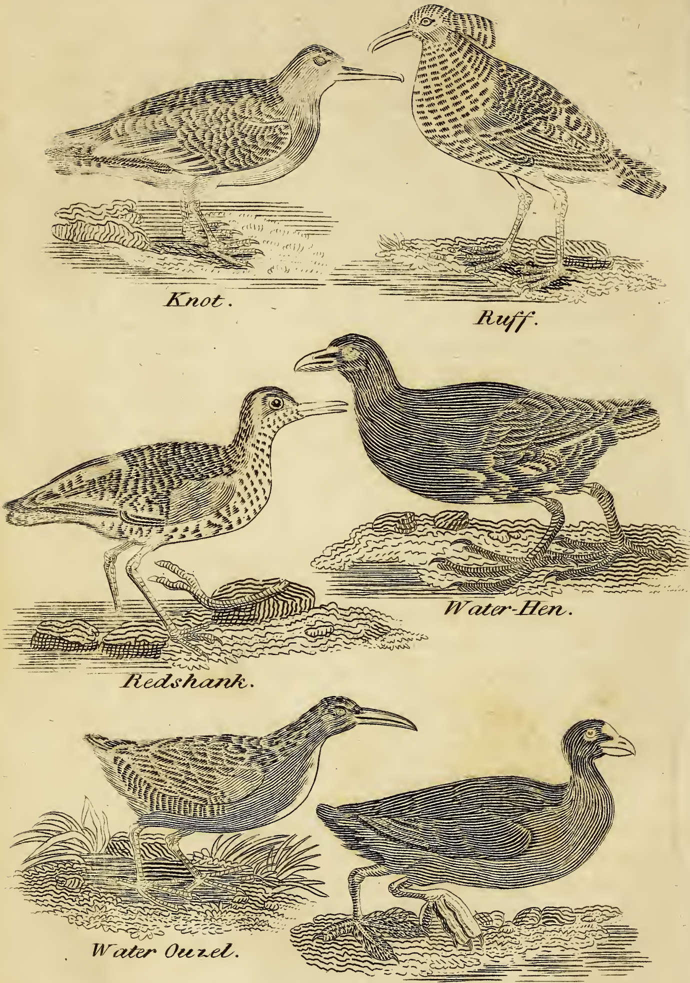
Snipes are birds of passage, supposed to breed principally in the lower lands of Switzerland and Germany; though some (particularly the jacks) remain and breed in the fens, and marshy swamps of England, where their nests and eggs are frequently found. They lay four or five eggs. They arrive there sooner or later in the autumn, regulated in respect to time, by the wind and weather; but never appear till after the first rains, and leave that country in the spring, as soon as the warmer sun begins to absorb or exhale the moisture from the earth, and denote the approach of summer.

Woodcock. (*Scolopax Minor.* Pl. 42.) This bird is about as large as a pigeon, with a bill three inches long, straight and furried the whole length. The crown of the head and back of the neck are barred with black, and a black streak runs from the bill to the eyes. The woodcock flaps its wings with some noise when it rises, and its flight is pretty rapid, but neither high nor long; and its descent is so sudden that it seems to fall like a stone. It flies very straight in a wood of tall trees, but in a copse it is often obliged to wind, and frequently drops behind bushes, to conceal itself from the eye of the fowler. It principally feeds on worms and insects, which it draws out of the mud with its long bill; and its flesh is universally admired. The female builds an artless nest on the ground, and generally lays four or five eggs.

The greater part of the woodcocks leave England about the latter end of February or the beginning of March, always pairing before they set out. They retire to the coast, and if the wind be fair, set out immediately; but if contrary, they are often detained in the neighbouring woods and thickets for some time. In this crisis the sportsmen are alert, and the whole surrounding country echoes the discharge of guns; seventeen brace have been killed by one person in a day. But if they are detained long on the dry heaths, they become so lean as to be scarcely eatable. The instant a fair wind springs up, they seize the opportunity; and where the sportsman has seen hundreds in one day, he will not find even a single bird the next.

Lapwing or Pee-wit. (Pl. 42.) This bird is about the size of a common pigeon, and is covered with very thick plumes, which are black at the roots, but of a different colour on the outward part. The feathers on the belly, thighs, and under the wings, are most of them white as snow: and the under part on the outside of the wings white, but black lower. It has a great liver, divided into two parts, and, as some authors affirm, no gall.

Pl. 43.



Knot.

Ruff.

Water-Hen.

Redshank.

Water Ouzel.

Coot.

Lapwings are found in most parts of Europe, as far northward as Iceland. In the winter they are met with in Persia and Egypt. Their chief food is worms; and sometimes they may be seen in flocks nearly covering the low marshy grounds in search of them, which they draw with great dexterity from their holes. When the bird meets with one of these little clusters of pellets, or rolls of earth, that are thrown out by the worm's perforation, it first gently moves the mould from the mouth of the hole, then strikes the ground at the side with its foot, and steadily and attentively wait the issue: the reptile, alarmed by the shock, emerges from its retreat, and is instantly seized.

These birds make a great noise with their wings in flying, and are called pee-wits, in the north of England, from their particular cry. They remain there the whole year. The female lays two eggs on the dry ground, near some marsh, upon a little bed which she prepares of dry grass. These are olive coloured, and spotted with black. She sits about three weeks; and the young, who are covered with a thick down, are able to run within two or three days after they are hatched.

Long-legged Plover. (Pl. 42.) This bird is of the plover family, and might with propriety be called the stilt plover. It weighs about four ounces. The naked part of the thighs measures three inches and a half, and the legs about four inches and a half. Hence we may safely assert, that these birds exhibit weight for inches, and have incomparably the greatest length of legs of any known bird. The flamingo, for instance, is one of the most long-legged birds, and yet it bears no manner of proportion to the himantopus, or loripes, which is the name most naturalists give this bird.

It must be matter of great curiosity, to see the stilt plover move; to observe how it can wield such a length of lever with such feeble muscles as the thighs seem to be furnished with. At best, one should expect it to be but a bad walker; but what adds to the wonder is, that it has no back toe. Now, without that steady prop to support its steps, it must be liable to perpetual vacillations, and seldom able to preserve the true centre of gravity.

These long-legged plovers are birds of South Europe, and rarely visit our island; and when they do, are wanderers and stragglers, and impelled to make so distant and northern an excursion from motives or accidents for which we are not able to account.

This bird is common in Egypt and the warmer parts of America, where it feeds on flies and other insects; but it is very rare in England.

Green Plover. This bird is much about the same size as the lapwing, and has a short round black bill, sharp at the end, and a little hooked. The tongue, which fills all the inner chap of the bill, is triangular at the tip, horny underneath, and turns a little up. The feathers of the back and wings are black, thick set with transverse spots of a yellowish green colour: the breast is brown, spotted with yellowish green; the belly is white: and, like the stilt plover, it has no hind claw or spur.

These birds are found in France, Switzerland, Italy, and in most counties of England; in all which places they are esteemed a choice dish, their flesh being very tender, and of an exceeding agreeable flavour. They feed chiefly upon worms; though some authors have affirmed they live, like the grasshopper, upon nothing but dew.

This bird was called paradalis by the ancients, from its beautiful spots, which somewhat resemble those of the leopard.

Knot. (Pl. 43.) This bird measures not more than nine inches and weighs only four ounces and a half. The head and neck are ash colour, the back and scapulars brown, with a white bar on the wings. They frequent the coast of Lincolnshire, from August to November, and when fattened are preferred by some to the ruffs themselves.

The Ruff. (Pl. 43.) The ruff, is about a foot in length, with a bill about an inch. The face is covered with yellow pimples; and the back part of the head and neck are furnished with long feathers, standing out somewhat like the ruff worn by our ancestors; a few of these feathers stand up over each eye, and appear not unlike ears. The colours of the ruffs are in no two birds alike: in general they are brownish; and barren with black: though some have been seen that were altogether white. The lower parts of the belly and the tail coverts are white. The tail is tolerably long, having the four middle feathers barred with black; the others are pale brown. The legs are of a dull yellow, and the claws black. The female, which is called the reeve, is smaller than the male, of a brown colour, and destitute of the ruff on the neck.

The ruffs are much more numerous than the reeves, and they have many severe contentions for their mates. The male chuses a stand on some dry bank, near a splash of water, round which he runs so often as to make a bare circular path: the moment a female comes in sight, all the males within a certain distance commence a general battle; placing their bills on the ground, spreading their ruff, and using the same action as a cock: and this opportunity is seized by the fowlers, who, in the confusion, catch them, by means of nets, in great numbers; yet even in captivity, their animosity still continues.

The reeves lay four eggs, in a turft of grass about the beginning of May; and the young are hatched in about a month.

Redshank. (Pl. 43.) This bird weighs about five ounces and a half, and is twelve inches long. The bill is two inches, red at the base, and black towards the point. The head, neck, and scapulars are dusky ash-colour, obscurely spotted with black: the back is white, spotted with black: the breast is white, streaked with dusky lines. When its nest is in danger it makes a noise somewhat similar to that of the lapwing.

The greenshank is a bird of the same kind as the former, but about two inches longer; its habits, disposition, modes of subsistence, and colour the same; with the exception of its legs, which are green, from which circumstance it is named.—They both feed by the sea shores, and sides of large rivers.

SANDPIPER. (*Tringa.*) There are at least forty varieties of this genus; among which, besides the two preceding, are the puno, and the turnstone.

The sandpiper is a small bird, seldom exceeding the size of a thrush, at least in England, and some of them are not bigger than a sparrow. In the milder climates there are larger species, such as the green, the spotted, the red, and the gambol pipers, many of which have been seen as large as pigeons.

The sandpiper of England weighs about two ounces; it has a brown head, streaked with a glossy green, and the breast and belly quite white. The bill is straight and slender, about an inch and a half long; the nostrils small, and the tongue slender. The toes are divided or slightly connected at the base by a membrane: the hinder toe is short and weak.

The whole of this tribe have a shrill pipe, or whistle, from which they derive their name, and which they constantly make use of.

WATER-HEN. (*Gallinula.* Pl. 43.) This race is considered by naturalists as the tribe which unite the web-footed kind with those of the crane species; for although they have long legs and necks like the latter, yet by being furnished with a slight membrane between their toes, they are enabled to swim like the former; the principal of them are the water hen, or gallinule, and the coots; these, though placed in different classes by those who are fond of nice distinctions, may be said, perfectly to resemble each other in figure, feathers, and habits; they both have long legs, with thighs almost bare of hair or feathers: their necks are rather long in proportion; their wings short, as are their bills, which are very weak; their general colour black, and their forehead bald and without feathers. Such are their similarities; and their slight differences are first in size, the water-hen weighing but fifteen ounces and the coot twenty-four. The bald part of the forehead in the coot is black, in the water-hen it is of a pink colour. The toes of the water-hen are edged with a straight membrane; those of the coot have it scolloped and broader. In shape and figure their differences are very trifling, and if possible, their manner of living still less; therefore the history of one will serve for both: yet we shall introduce an engraving of each.

As birds of the crane kind are furnished with long wings, and easily change place, the water-hen, whose wings are short, is obliged to reside entirely near those places where her food lies: she cannot take those journies that most of the crane kind are seen to perform; compelled by her natural imperfections, as well perhaps as by inclination, she never leaves the side of the pond or the river in which she seeks her provision. She builds her nest upon low trees and shrubs, of sticks and fibres, by the water side. Her eggs are sharp at one end, white, with a tincture of green spotted with red. She lays twice or thrice in a summer; her young ones swim the moment they leave the egg, pursue their parent, and imitate all her manners. She rears in this manner two or three broods in a season; and when the young are grown up, she drives them off to shift for themselves.

Coot. (*Fulica.* Pl. 43.) As the coot is a large bird, it is always seen in larger streams, and more remote from mankind. The water-hen seems to prefer inhabited situations: she keeps near ponds, moats, and pools of water near gentlemen's houses; but the coot keeps in rivers, and among rushy margined lakes; it there makes a nest of such weeds as the stream supplies, and lays them among the reeds, floating on the surface, and rising and falling with the water. The reeds among which it is built keep it fast, so that it is seldom washed into the middle of the stream. But if this happens, which is sometimes the case, the bird sits in her nest, like a mariner in his boat, and steers with her legs her cargo into the nearest harbour; there, having attained her port, she continues to sit in great tranquillity, regardless of the force of the current; and though the water penetrates her nest, she hatches her eggs in that wet condition.

The water-hen never wanders; but the coot sometimes swims down the current, till it even reaches the sea. In this voyage these birds encounter a thousand dangers; as they cannot fly far, they are hunted by dogs and men; as they never leave the stream, they are attacked and destroyed by otters: they are preyed upon by kites and falcons; and they are taken in still greater numbers, in weirs made for catching fish.

Water Ouzel. (Pl. 43.) The water ouzel, called also the water rail, is in size somewhat less than the blackbird. Its bill is black, and almost straight. The eye-lids are white. The upper parts of the head and neck are of a deep brown; and the rest of the upper parts, the belly, vent, and tail, are black. The chin, the fore part of the neck, and breast, are white or yellowish. The legs are black.

This bird frequents the banks of springs or brooks, which it never leaves; preferring the limpid streams whose fall is rapid, and whose bed is broken with stones and fragments of rocks. The habits of the water ouzel are very singular. Aquatic birds with palmated feet, swim or dive; those which inhabit the shores, without wetting their body, wade with their tall legs; but the water ouzel walks quite into the flood, following the declivity of the ground. It is observed to enter by degrees, till the water reaches its neck; and it still advances, holding its head not higher than usual, though completely immersed. It continues to walk under the water; and even descending to the bottom, where it saunters as on dry land.

These birds are found in many parts of Europe. The female makes her nest on the ground, in some mossy bank near the water, of hay and dried fibres, lining it with dry oak leaves, and forming to it a portico or entrance of moss. The eggs are five in number, white, tinged with a fine blush of red. It will sometimes pick up insects at the edge of the water. When disturbed, it usually flirts up its tail and makes a chirping noise. Its song in spring is said to be very pretty. In some places it is supposed to be migratory.

# OF FISH.

## REMARKS ON FISH IN GENERAL.

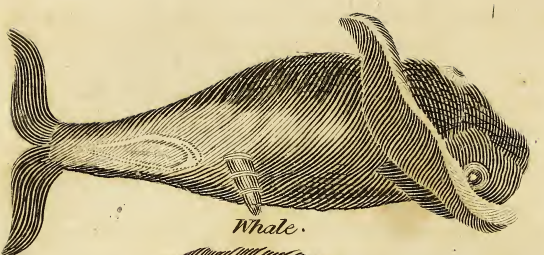
It has been proved from experience, that the very depths of the immense ocean contain myriads of creatures, to whose very form we are almost strangers, and of whose dispositions and manners we are still more ignorant. In their construction, however, modes of life, and general design, these creatures are as truly wonderful as the inhabitants of either the land or air.

The structure of fish, and their conformation to the element in which they are to live, are eminent proofs of divine wisdom. Most of them have the same external form, sharp at each end, and swelling in the middle, by which configuration they are enabled to traverse the watery element with greater ease and swiftness. From their shape, men have taken the idea of those vessels which are intended to sail with the greatest speed; but the progress of the swiftest sailing ship, with the advantage of a favourable wind, is far inferior to that of fish. Ten or twelve miles an hour is no small degree of rapidity in the sailing of a ship; yet any of the larger species of the watery tribe would soon overtake her, play round as if she did not move, and even advance considerably before her.

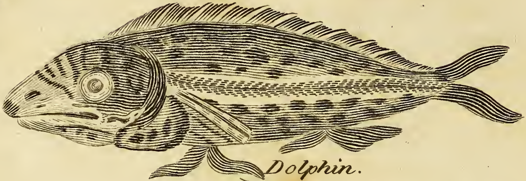
The fins of fish are denominated from their situations. The pectoral fins are placed at a little distance behind the opening of the gills, and are large and strong, and serve as well to balance the body as to assist the motion of the fish. The ventral fins are placed towards the lower part of the body, under the belly, and serve chiefly to raise or depress the fish in the water. The dorsal fins are situated on the ridge of the back, and are very large in flat fish; their use, like the pectoral ones, is to keep the body in equilibrio, as well as to contribute to its progressive motion. The anal fins are placed between the vent and the tail, enabling the fish to keep an upright position.

The aquatic race of beings have in general been placed in a very inferior scale of importance, on the score of animal faculties; yet, natural and experimental observations have proved that they are possessed of all the necessary organs of seeing, hearing, smelling, and feeling, in an equal degree to either quadrupeds or birds.

Voracity is the chief characteristic of aquatic animals. Those with the largest mouth pursue almost every thing that hath life; and often meeting each other in fierce opposition, the fish with the largest swallow comes off victorious, and devours its antagonist. As a counterbalance to this great voracity, however, fish are incredibly prolific. Some bring forth their young alive, others produce only eggs: the former are rather the least fruitful; yet even those produce in great abundance. The viviparous blenny for instance, brings forth two or three hundred at a time. Those which produce eggs, which they are obliged to leave to chance, either on the bottom where the water is shallow, or floating on the surface where it is deeper, are all much more prolific, and seem to proportion their stock to the danger there is of consumption. Naturalists declare, that the cod spawns above nine millions in a season. The flounder commonly produces about one million, and the mackerel above five hundred thousand. Scarce one in a hundred of these eggs, however, brings forth an animal: they are devoured by all the lesser fry that frequent the shores, by water fowl in shallow waters, and by the larger fish in deep waters. Such a prodigious increase, if permitted to come to maturity, would overstock nature: even the ocean itself would not be able to contain, much less provide for, one half of its inhabitants. But two wise purposes are answered by their amazing increase; it preserves the spe-

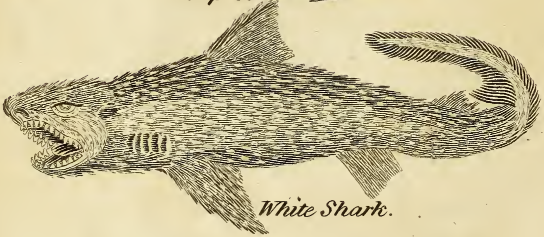


Whale.

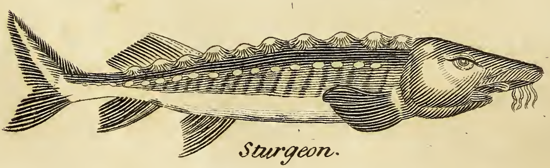


Dolphin.

Porpus.



White Shark.



Sturgeon.

cies in the midst of numberless enemies, and serves to furnish the rest with a sustenance adapted to their nature.

Fish, like the land-animals, are either solitary or gregarious. Some, as trout, salmon, &c. migrate to deposit their spawn. Of the sea-fish, the cod, herring, &c. assemble in immense shoals, and migrate in these shoals through vast tracts of the ocean.

WHALE. (*Balæna. Mammalia Class.* Lin. Pl. 44.) The whale is of the cetaceous order of fish, and produces its young alive; and the ancients have described it as being six hundred feet in length. At present it is only found in the northern seas ninety feet in length, and twenty in breadth; but formerly they were taken of a much greater size, when the captures were less frequent, and the fish had time to grow. Such is their bulk within the arctic circle; but in those of the torrid zone, many are seen a hundred and sixty feet long. There are many turnings and windings in this fish's nostrils, and it has no fin on the back. The head is very much disproportioned to the size of the body, being one third the size of the fish; and the under lip is much broader than the upper. The tongue is composed of a soft spungy fat, capable of yielding five or six barrels of oil. The gullet is very small for so vast a fish, not exceeding four inches in width.

This fish varies in colour; the back of some being red, the belly generally white. Others are black, some mottled, others quite white. Their colours in the water are extremely beautiful, and their skin is very smooth and slippery. Every species of whale propagates only with those of its kind, and does not at all mingle with the rest; however, they are generally seen in shoals, of different kinds together, and make their migrations in large companies from one ocean to another.

Whales are chiefly taken in the northern seas. The English send out with every ship six or seven boats; each of these has one harpooner, one man at the rudder, one manager of the line, and four seamen to row it. In each boat there are also two or three harpoons, several lances, and six lines, each one hundred and twenty fathoms long, fastened together.

As soon as the whale is struck with the harpoon it darts into the deep, carrying the instrument off in his body; and so rapid is its motion, that if the line was to entangle, it would either snap like a thread, or overset the boat: one man therefore is stationed to attend only to the line, that it may go regularly out, and another is also employed in continually wetting the place it runs against, that the wood may not take fire from the friction. On the whale's return to breathe, the harpooner inflicts a fresh wound, till at length, fainting from loss of blood, the men venture the boat quite up to him, and a long steeled lance is thrust into his breast and other parts, which soon puts an end to his existence.

When the carcase begins to float, holes are cut in the fins and tail, and ropes being fastened into these, he is towed to the ship, where he is fastened along the larboard side, floating with his back on the water.

In order to take out the bluober and whalebone, several men now get upon the animal with iron calkers or spurs, to prevent their slipping, and separate the tail, which is hoisted on deck. They then cut out square pieces of blubber, weighing two or three thousand pounds each, which by means of the capstan, are also hoisted up. These are cut into smaller pieces, which are thrown into the hold, and left for three or four days to drain. When all the blubber is cut from the belly of the fish, it is turned on one side, by means of a piece of blubber left in the middle, called the cant, or turning piece. They then cut out this side in large pieces as before, and also the whalebone, with the gums, which are preserved entire, and hoisted on deck, where the blades are cut and separated, and left till the men have time to scrape and clean them. The whale is next turned with its back upwards, and the blubber cut out from the back and crown bone: they conclude the whole by cutting the blubber from the other side. Before, however, the remainder of the body is left to float away, they cut out the two large upper jaw-bones, which are hoisted on deck, cleansed, and fastened to the shrouds, and tubs are placed under them to receive the oil which they discharge; which oil belongs to the captain.

In three or four days they hoist the pieces of blubber out of the hold, chop and put them by in small pieces through the bung-holes into the casks.

A whale, the longest blade of whose mouth measures nine or ten feet, will yield about thirty butts of blubber; but some of the largest will yield upwards of seventy. One of the latter is generally worth about one thousand pounds sterling; and a full ship of about three hundred tons burthen, will produce more than five thousand pounds from one voyage.

The whale-fishery begins in May, and continues through the months of June and July: but whether the ships have had good or bad success, they must come away and get clear of the ice by the end of August: so that in the month of September, at furthest, they may be expected home; but the most fortunate ships often return in June or July.

**Dolphin.** (*Delphinus.* Pl. 44.) The dolphin has an almost straight shape, the back being very slightly incurvated, and the body slender; the nose is long, narrow, and pointed, with a broad transverse band, or projection of the skin on its upper part. It has twenty-one teeth in the upper, and nineteen in the lower jaw, somewhat above an inch long, conic at the upper end, sharp pointed, and bending a little in. They are placed at a small distance from each other; so that when the mouth is shut, the teeth of both jaws lock into each other; the spout-hole is placed in the middle of the head; the tail is semilunar: the skin is smooth; the colour of the back and sides dusky; the belly whitish; it swims with great swiftness, and its prey is fish. The dolphin is longer and more slender than the porpus, measures nine or ten feet in length, and two in diameter.

All this species have fins on the back; very large heads, like the rest of the whale kind; and resemble each other in their appetites, their manners and conformation, being equally voracious, active, and roving. No fish could escape them, but from the awkward position of their mouth, which is placed in a manner under the head; and their agility is so great as to prevent them from being often taken. They seldom remain a moment above water, though their too eager pursuit after prey sometimes exposes them to danger.

A shoal of dolphin will frequently attend the course of a ship for the scraps that are thrown overboard, or the barnacles adhering to their sides. They inhabit the European and Pacific ocean.

The flesh, though tolerably well tasted, is dry and insipid: the best parts are near the head. It is seldom eaten but when young and tender. Dolphins are said to change their colour before they die, and again after they are dead.

Porpus. (*Delphinus Phocœna.* Pl. 44.) The general form of the porpus very much resembles that of the dolphin. It is however somewhat less in size, and has a snout much broader and shorter. It is generally from six to seven feet in length; its body is thick towards the head, but grows slender towards the tail, forming the figure of a cone. In each jaw are forty eight teeth, small, sharp-pointed, and moveable; and so placed that the teeth of one jaw look into those of the other. The eyes are small; as is the spout-hole at the top of the head. In colours the back is black, and the belly is whitish, but they sometimes vary.—Porpuses are very numerous in all the British seas, but more particularly in the river St. Lawrence, in America; where there is a white kind.

These animals live chiefly on the smaller fish; at the season when mackerel, herrings, pilchards, and salmon appear, the porpuses swarm; and such is its violence in pursuit of its prey, that it will follow a shoal of small fish up a fresh water river, from whence it finds a difficulty to return. These creatures have been often taken in the river Thames, both above and below London-bridge; and it is curious to observe with what dexterity they avoid their pursuers, and how momentarily they recover their breath above the water. It is usual to spread four or five boats over the part of the river where they are seen, and to fire at them the instant they rise. One porpus yields about a hogshead of oil, and therefore renders its capture an object of consideration.

WHITE SHARK. (*Squalus.* Pl. 44.) The white shark has six rows of teeth, hard, sharply pointed, and of a wedge-like figure; these, he has the power of erecting and depressing at pleasure: when at rest, they are quite flat in his mouth; but when his prey is to be seized, they are instantly erected by a set of muscles that join them in the jaw. Thus, with open jaw, goggling eyes, and large and bristly fins, agitated like the mane of a lion, his whole aspect is a striking picture of the fiercest, deepest, and most savage malignity. These creatures are the dread of sailors in all the hot climates, where they constantly attend the ships, in expectation of what may drop overboard; and if, in this case, any of the men have that misforture, they must inevitably perish.

In the pearl fisheries of South America, every negro, to defend himself against these animals, carries with him into the water, a sharp knife; which, if the fish offers to assault him, he endeavours to strike into its belly; on which it generally swims off. The officers who are in the vessels keep a watchful eye on these voracious creatures; and when they observe them approach, shake the ropes fastened to the negroes to put them on their guard.—Many of them, when the divers have been in danger, have thrown themselves into the water, with knives in their hands, and hastened to their defence; but too often all their dexterity and precaution have been of no avail.

STURGEON. (*Accipenser Strurio.* Lin. Pl. 44.) Though this fish from its size and construction appears formidable, yet it is perfectly harmless; the body, which is from six to eighteen feet in length, is pentagonal, armed from head to tail with five rows of large bony tubercles, each of which ends in a strong recurved tip; one of these is on the back, one on each side, and two on the margin of the belly. The snout is long, and obtuse at the end, and has the tendrils near the tip. The mouth, which is beneath the head, is somewat like the opening of a purse, and is so formed as to be pushed suddenly out, or retracted. The upper part of the body is of a dirty olive colour; the lower parts silvery; and the tubercles are white in the middle. The tendrils on the snout, which are some inches in length, have so great a resemblance in form to the earth-worms, that at the first sight, they might be mistaken for them. By this contrivance, this clumsy toothless fish is supposed to keep themselves in good condition, the solidity of his flesh evidently showing him to be a fish of prey. He is said to hide his large body among the weeds near the sea-coast, or at the mouths of large rivers, only exposing his tendrils, which small fish or sea insects, mistaking for real worms, approach for plunder, and are sucked into the jaws of their enemy.—He has been supposed by some to root into the soil at the bottom of the sea or river; but the tendrils abovementioned, which hang from his snout over his mouth, must themselves be very inconvenient for this purpose; and as he has no jaws, he evidently lives by suction, and, during his residence in the sea, marine insects are generally found in his stomach. From its quality of floundering at the bottom of the rivers, the sturgeon has received its name from the Germans, the word stoeren signifying to wallow in the mud.

Sturgeons are found both in the European and American seas. At the approach of spring, they leave the deep recesses of the sea, and enter the rivers to spawn; and from May to July the American rivers abound with them. As they are not voracious fish, they are never caught by baits, but in nets composed of small cords, and placed across the mouth of the river, but in such a manner, that whether the tide ebbs or flows, the pouch of the net goes with the stream.

TORPEDO. (*Raja. Ray Fish.* Pl. 45.) There are about twenty species of the ray, of all which the torpedo, or electric ray, is the most remarkable, as it possesses some very distinguishing peculiarities. In the general structure of its body it has not been found to differ materially from the rest of the rays. The electric or benumbing organs are placed one on each side of the gills, reaching from thence to the semicircular cartilages of each great fin, and extending longitudinally from the interior extremity of the animal to the transverse cartilage which divides the thorax from the abdomen, and within these limits they occupy the whole space between the skin of the upper and under surfaces. Each organ is about five inches in length, and at the interior end, about three in breadth; they are composed of perpendicular columns, reaching from the upper to the under surface, varying in length according to the thickness of the parts of the body, from an inch and a half to half an inch. The head and body of the torpedo are distinct from each other, and nearly of a circular form: the skin is smooth, of a dusky brown colour above, and white underneath: the ventral fins form on each side, at the end of the body, nearly a quarter of a circle: the tail is short, and the dorsal fins are placed near its origin: the mouth is small, and, as in other species, there are on each side below it, five breathing apertures.

The electric rays are found in many of the European seas, and the fisherman often discover it in Torbay, and sometimes of such a size as to weigh eighty pounds.—They are partial to sandy bottoms, in about forty fathoms of water, where they often bury themselves by flinging the sand over them, by a quick flapping of all the extremities. In Torbay they are generally taken like other flat-fish, with the trawl-net: and instances have occurred of their seizing a bait. They bring forth their young in autumn.

This fish's benumbing or torporific quality, is one of the most potent and extraordinary faculties in nature.—The ignorant stranger might imagine he is only handling a skate, when he is instantly struck numb.—Upon touching the torpedo with the finger, it frequently, though not always happens, that the person feels an unusual pain and numbness, which suddenly seizes the arm up to the elbow, and some times to the very shoulder, or head.

Its chief force is at the instant it begins; it lasts but a few moments, and then vanishes entirely. If a man do not actually touch the torpedo, how near soever he holds his hands, he feels nothing: if he touch it with a stick, he feels a faint effect: if he touch it through the interposition of any pretty thin body, the numbness is felt very considerably; if the hand be prest very strong against it the numbness is the less, but still strong enough to oblige a man speedily to let go.

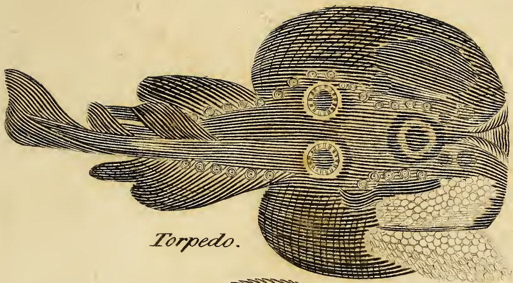
The engraving displays the interior of the lower electric or galvanic organ.

HORNED SILURE. (*Siluris.* Pl. 45.) The head of this fish is broad, flat, and thin: and the horns which occupy the place of eyes in other species, are armed with short crooked spines like teeth, and are probably weapons of defence. The eyes lie on each side of the head, near the mouth. The head and body are entirely covered with a skin resembling leather; and the tail-fin slightly forked.

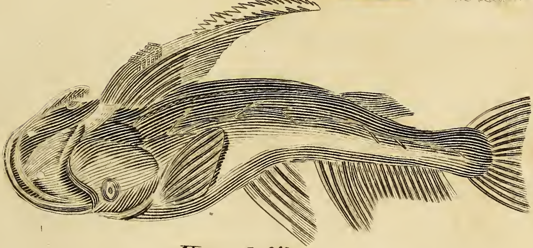
This fish is of a very dark green colour; the sides are somewhat lighter. Another remarkable peculiarity in this fish is the dorsal fin: it is close to the head: and its front ray is long, stiff, dentated like the horns, and is probably an instrument of defence also. The belly is short and thick; and the leteral line goes meandering along the middle of the body, and puts out branches each way. This species grows to a considerable size; its flesh is eatable, but not much sought after. It is found near the shores of Asia and Surinam.

One of these fish caught at Surinam, on examination, was observed to have its mouth filled with yellow eggs. in none of which however, could be found a fish completely formed; from which it is concluded, that the silure, to defend her eggs from the voracious tribes, hatches them instinctively in her mouth. But she is supposed at times to emit them from her mouth, when in search of food to appease her appetite, and, when satisfied, to take them in her mouth again.

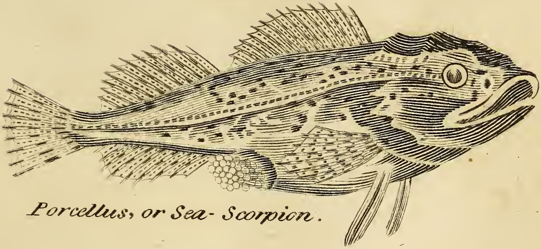
Of the silure tribe, there are upwards of thirty different species, of which, our limits will not allow us to give a description.



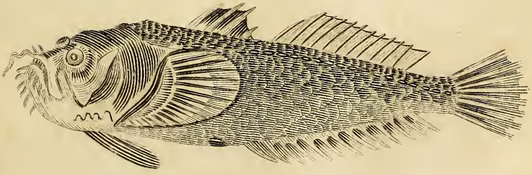
*Torpedo.*



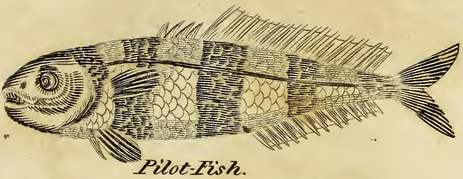
*Horned Silure.*



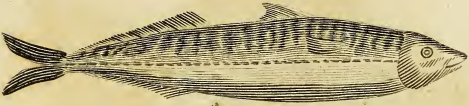
*Porcellus, or Sea-Scorpion.*



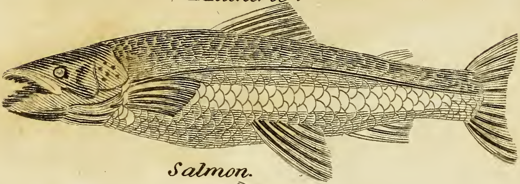
*Star-Gazer.*



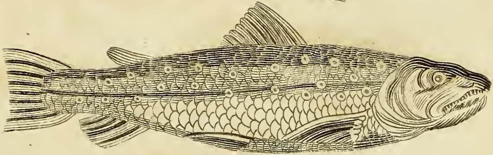
*Pilot-Fish.*



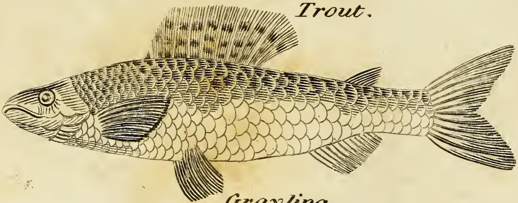
*Mackerel.*



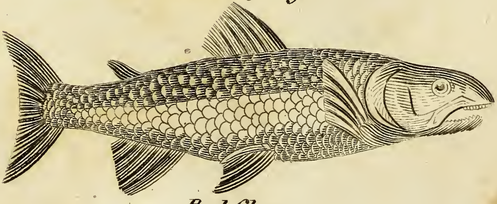
*Salmon.*



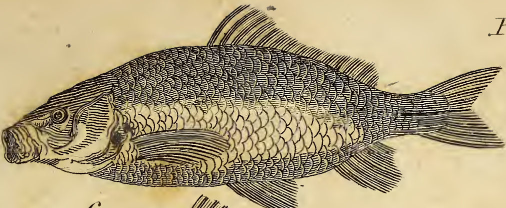
*Trout.*



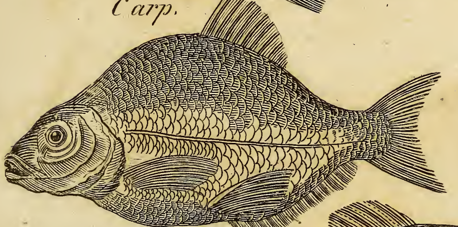
*Grayling.*



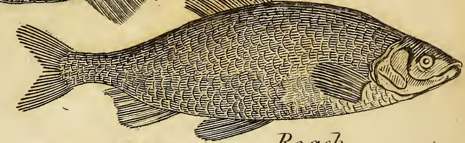
*Red Char.*



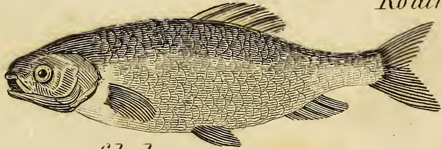
Carp.



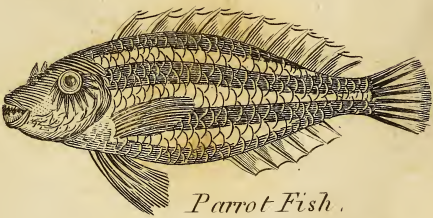
Bream.



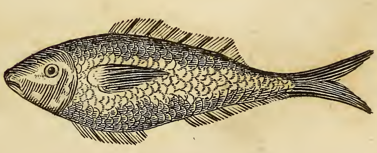
Roach.



Chub.



Parrot Fish.



Gold Fish.

Porcellus, or Sea-Scorpion. (Pl. 45.) The mouth of this curious fish is wide, but without teeth: the head is flattish in the middle, but over each eye there appears a serated ridge rising from it. The gills on each side have sharp horny spurs on their edges tending backwards, by which it derives its latter name. The body is almost as wide as it is deep, and the under side is of a silverish colour, tinged with red. The upper side is of a dusky brown, sprinkled with small black spots, with some large clouds of black. It has a lateral line from head to tail, and also two fins on the back, one on the belly, behind the vent, and tail-fin. Two narrow fins or feelers, are placed under the fore-part of the belly, of a whitish colour, each having only three spines.

This fish is found in the Mediterranean sea, and in several parts of the ocean. It keeps near the shores, and lies concealed among sea-weed, to prey on small strayed fish.

Star-Gazer. (Pl. 42.) The head is large, quadrangular, and covered with a rough helmet, which ends in two spines above, and in five smaller ones below. The mouth opens upwards; and, when the lower jaw is removed, the tongue appears, which is thick, short, and strong, and full of small teeth. There is a membrane inside the lower jaw, terminating by a long filament; the fish, opening its mouth, sets this in motion, which attracts little fish, who endeavour to seize it, and are presently devoured: there are two barbels from each lip, which serve for the same purpose; and this fish only conceals itself among the sea-weed, leaving only the barbles visible, when watching for prey. There are two oval apertures in the upper jaw, and several little barbles at the lower; near each eye is a round aperture. The eyes lie quite at the top of the head, very close together, and prominent, as if starting upwards; the pupil is black, iris yellow.

The star-gazer inhabits the Mediterranean, lying in deep places near the shore. It seldom exceeds a foot in length, living on small fish and worms.

PILOT FISH. (Pl. 46.) The body is long and banded, with four loose spines on the back; the head compressed, rounded off in front, without scales as far as the gills. The mouth is small; the jaws are of an equal length, and furnished with small teeth; the palate has a curved row of similar teeth in front, and the tongue has teeth all along; it is short, fleshy, and hardly moveable. The nostrils are double, nearer the muzzle than the eyes. The lateral line is curved first upwards and then downwards, and is lost at the end of the tail; which is raised similar to many of the mackerel kind.

This species is found in the Mediterranean, Southern Ocean, East Indies, and at the Cape of Good Hope. It grows to a foot and a half in length, and is well tasted. It derives its names from being commonly seen with the shark, to whom it appears to point out its prey.

MACKEREL. (*Scomber.* Pl. 46.) The common mackerel has a thick, round, fleshy body, but tapering towards the tail, which is bifarcated. Its body is of a very elegant form, and beautifully variegated with the brighest hues of blue, green, and a silvery whiteness. Death in some measure impairs the colours, but it by no means obliterates them. Several varieties of this fish inhabit the ocean: they belong to the voracious class, and some of them grow to a very great size. As they are found in the German ocean, the Baltic and Mediterranean, it is not surprising that the ancient naturalists were acquainted with them. Subsequent naturalists have reckoned upwards of thirty varieties, but of these, only three are found upon our coasts; these are the common mackerel, the bastard or horse mackerel, and the thunny.

This fish emits a phosphoric light when fresh from the sea: it soon dies when taken out of the water, and even in the water, if it advance with two much impetuosity against the net. It is caught with that instrument, or with a hook baited with small herrings and pieces of other kinds of fish or flesh. In some places it is taken by lines from boats, as during a fresh gale of wind it readily seizes a bait: it is necessary that the boat should be in motion, in order to drag the bait along near the surface of the water. The great fishery for mackerel is on some parts of the west coast of England. This is of such an extent, as to employ in the whole a capital of near two hundred thousand pounds. The fishermen go out to the distance of several leagues from the shore, and stretch their nets, which are sometimes several miles in extent, across the tide, during the night. The meshes of these nets are just large enough to admit the heads of tolerable large fish, and catch them by the gills. A single boat has been known to bring in, after one night's fishing, a cargo that has sold for near seventy pounds.

The mackerel is very good eating; but as it is fat, and consequently difficult of digestion, it is not fit for weakly persons or valetudinarians.

Rapid and stony rivers, where the water is free from mud, are the favourite places of most of the salmon tribe, the whole of which is supposed to afford wholesome food to mankind. These fish when taken out of their natural element, very soon die; to preserve the flavour they must be killed as soon as they are taken out of the water. The fishermen usually pierce them near the tail with a knife, when they soon die with loss of blood.

Trout. (Pl. 46.) The general shape of the trout is rather long than broad; in several of the Scotch and Irish rivers, they grow so much thicker than in those of England, that a fish from eighteen to twenty-two inches, will often weigh from three to five pounds. This is a fish of prey, has a short roundish head, blunt nose, wide mouth, filled with teeth, not only in the jaws, but on the palate and tongue; the scales are small, the back ash colour, the sides yellow, and when in season, is sprinkled all over the body and covers of the gills with small beautiful red and black spots: the tail is broad.

There are several sorts of trouts differing in their size, shape and hue; but the flesh of the best is either red or yellow, when drest; the female has a smaller head and deeper body than the male, and its spots vary greatly in different waters, and at different seasons.

This fish, although very delicate, and at present well known, was in no esteem among the ancients. It is said to be in season from March to September. It is, however, fatter from the middle to the end of August, than at any other time.

The trout is not easily caught with a line, being at all times exceedingly circumspect. The baits used are worms or artificial flies. The season for fishing is from March till Michaelmas. Cloudy weather is generally preferred for angling, but there is no particular time of the day.

GRAYLING. (*Salmo.* Pl. 46.) This fish is of a very elegant form; the body is less deep than that of the trout: the head small, with protuberant eyes, the irides of which are silvery, speckled with yellow; the mouth is of a middle size, and the upper jaw the largest. The teeth are very minute, seated in the jaws and roof of the mouth, and feel like a fine file; the head is dusky, the covers of the gills of a glossy green, yet when in prime perfection, these parts are blackish; the back is of a dusky green, inclining to blue; the sides of a fine silvery gray; yet, when first taken, they seem to glitter with spangles of gold, and are marked with black spots irregularly placed. The side line is nearly straight; the scales are large, and the lower edges dusky, forming straight rows from the head to the tail, which is much forked: the large dorsal fin is spotted, the other fins are plain; it is rather hog-backed, and, from the nose and belly touching the ground together, it is supposed that this fish feeds mostly at the bottom.

The grayling haunts rapid and clear streams, particularly such as flow from mountainous countries. In Lapland, (where it is very common,) the inhabitants use its entrails, instead of rennet, to make the cheese, which they get from the milk of the rein deer. The grayling seldom exceeds sixteen inches in length; yet one was taken, about half a yard long, and weighing four pounds six ounces; and one was caught which weighed full five pounds.

These fish bite during the whole of cool, cloudy days; but the preferable time in spring and summer is from eight until twelve in the morning, and from four until sunset in the evening; and from September to January, in the middle of the day.

Red Carp. (Pl. 46.) The head of this fish terminates in a blunt point. The body is covered with very minute scales; the lateral line is straight. All the fins except the dorsal, are reddish. This species is very properly denominated the Alpine Char, by Linnæus; for its constant residence is in the lakes of the high and mountainous parts of Europe. A few are found in some of the lakes in Wales, and in Loch Inch, in Scotland; from which last it is said to migrate into the Spey to spawn. Seldom, however, does this species venture into any running stream; its principal resort is in the cold lakes of the Lapland Alps, where it is fed by the innumerable quantity of gnats that infest those dreary regions.

The largest and most beautiful chars are found in the lake of Winander-Mere, in Westmoreland, England, where there are three species, the red, the gilt, and the case char. These kinds are nearly similar in their external appearance; but the time and manner of their spawning is very different. The method of taking these fish is with nets, or trammels as they are called, which are furnished with bait to allure the fish, and left for several days, till they are known to enter them.

Carp. (*Cyprinus.* Pl. 47.) The mouth of this fish is toothless; their gills have three rays, and their belly fins frequently nine. Their form is somewhat thick, and their colour blue-green above, greenish-yellow mixed with black on the upper part of their sides, whitish beneath, and the tail yellow or violet. The scales are large. On each side of the mouth there is a single beard, and above this another shorter. The dorsal fin is long, extending far towards the tail, which is forked. They are found in the slow rivers and stagnant waters of Europe and Persia, and principally in deep holes, under the roots of trees, hollow banks, or great beds of flags, &c. When full grown, they are nearly four feet in length, and twenty pounds in weight. Carps are supposed to have been brought into England by a Sussex gentleman, about the year 1514, in which county perhaps this fish abounds, more than in any other.

Carp from their quick growth and vast increase, are the most valuable of all fish for the stocking of ponds; and if the breeding and feeding of them were better understood, and more practised, the advantages resulting from them would be very great. These fish spawn in June, and sometimes in May, when it is a forward spring, seeking places covered with grass or plants, for depositing their eggs. They feed principally on mud worms, and aquatic insects.

BREAM. (*Cyp.* Pl. 47.) The bream has a blunt snout, the upper jaw a little protubed; the front is dark blue, the cheeks inclining to yellow. The fish, when at its full growth, is broad and thick; the young ones on the contrary, are narrow and long. They are covered with pretty large scales, the back is blackish, sharp, and resembles a bow on the stretch. The lateral line is curved towarsd the belly, and ornamented with about fifty black spots. The tail is a little forked, and of a dark blue colour.

This fish is an article of great importance on the Continent. It is found in all the great lakes, and in rivers which have a gentle current, and a bottom composed of marl, clay, and herbage. It is taken mostly under the ice; and this fishery is so considerable, that in some of the lakes beloning to Prussia, there have been taken to the value of two hundred pounds at a time; they are also caught in great quantities in Holstein, Mechlenburg, Livonia, and Sweden: in a lake near Norkiæping, there were taken at one time in March, 1749, no less than fifty thousand, weighing eighteen thousand two hundred pounds.

The bream may be taken with divers kinds of nets in spawning-time: and, being fond of worms, will readily take a bait.

ROACH. (*Cyp.* Pl. 47.) This fish belongs also to the cyprinus order, and is remarkable for its numerous progeny. It is deep, yet thinly made; in shape nearly resembling the bream, but approaching to the carp by the breadth and shape of its scales, which are large and deciduous. The soundness of the flesh is become proverbial, and pleases the taste by a peculiar delicacy of flavour. The belly-fins are of a bright crimson, and the irides of the eyes sparkle like rubies and granate. The size of the roach is commonly between nine and ten inches, but attains sometimes a greater bulk.

Perch. This fish seldom grows to any great size, and the largest of which we have any account is said to have weighed nine pounds. The body is deep, the scales rough, the back arched, and the side lines placed near the back. For beauty of colour, the Perch nearly equals the gaudiest of the inhabitants of the ponds, lakes, and rivers; the back glows with the deep reflections of the brightest emerald, divided by five broad stripes; the belly imitates the tints of the opal and mother of pearl, and the ruby hues of the fins complete an assemblage of colours most harmonious and elegant. It is a gregarious fish, and is caught in several rivers of this island; the flesh is firm, delicate, and much esteemed. They are generally boiled in wine or vinegar, which adds a considerable solidity and flavour to the flesh.

These animals are remarkably tenacious of life; and some of them, particularly the river-perch, have been carried sixty miles among straw, and have survived the journey. From the ease with which this fish is taken and transported, it has become the most common inhabitant of our fish-ponds.

Chub. (*Cyp.* Pl. 47.) The chub is of a coarse nature, and full of bones; it seldom exceeds the weight of five pounds. The body is of an oblong shape nearly round; the head, which is large, and the back, are of a deep dusky green, the sides silvery, and the belly white; the pectoral fins are of a pale yellow, the ventral and anal ones red; and the tail brown, tinged with blue at its extremety, and slightly forked. This fish frequents the deep holes of rivers, but in the summer season, when the sun shoots his golden darts through the pellucid waters, to the smooth and resplendent pebbles that pave the bed of the stream, it ascends to the surface and lies quiet under the cooling shade of some trees that spread their foliage on the verdant banks; but yet, though it seems to indulge itself in slumbers, the fear of danger, that innate sense of self-preservation, one of the first laws of nature, keeps the creature awake, and at the least alarm it dives with rapidity to the bottom. It lives on all sorts of insects; in March and April, the chub is to be caught with large red worms; in June and July with flies, snails and cherries; but in August and September, the proper bait is good cheese pounded in a mortar, with some saffron and a little butter. Some make a paste of cheese and Venice turpentine for the chub in water, at which season this fish is much better than at any other, the bones are less troublesome, being more easily separated from the flesh in this season, and the flesh more firm and better tasted; the roe is also well flavoured in general. If the angler keeps his bait at the bottom in cold weather, and near the surface in the hot season, the fish is sure to bite soon, and will afford much pleasing sport.

The ancient naturalists have enumerated five varieties of this fish; some of which are found in the Danube and the Rhine. The above species inhabits most of the rivers in Great Britain.

Parrot Fish. (*Cyp.* Pl. 47.) The head of this fish is somewhat similar to the carp. The body is broad, the tail narrow. The ground colour is red, which is beautifully relieved by broad silvery stripes all along the body; the belly is white. The fins are small; the scales broad, thin, finely radiated, and very loose. The pectoral, tail, and ventral fins, are yellow at their origin, and gray at the extremeties; and a kind of spine runs along the root of the ventral fin.

This species is found in both Indies; it takes its name from the Isle of St. Croix at the Antilles, from whence a specimen of it was received.

Gold-Fish. (*Cyp.* Pl. 47.) These fish are esteemed the most elegant of all the finny tribe. The male is of a bright red colour from the top of the head to the middle of the body; the rest is of a gold colour, but it is so splendid that the finest gilding cannot approach it. The female is white, but her tail and half of her body resembles the lustre of silver. The red and white colours are not always the distinguishing marks of the male and female; but that the females are known by several white spots which are seen round the orifices, that serve them as organs of hearing, and the males by having these spots much brighter. The nostrils of the gold-fish are double, wide, and placed near the eyes. The body is covered with large scales, and the tail is forked; but there is no fish in which the fins vary so much. The colour of the gold fish changes with age. In the first year it is generally black, a colour very rarely found among the inhabitants of the watery element. In the course of a few years, silver spots make their appearance, and gradually increase till they cover the whole body. It then turns red, and becomes more beautiful the older it grows. Sometimes, indeed, it turns red before it assumes the silver hue, and in some instances, the fish is red from the very first.

These fish are natives of a lake not far from the high mountain of Tsienking, near the city of Tehangou, situated in the province of Che Kiang, in China. From this place they were transported to the other provinces of that empire, to Japan, and at length to Europe.

Cod. (*Gadus.* Pl. 44.) The head of the cod fish is smooth; the colour on the back and sides is of a dusky olive, variegated with yellow spots; its belly is white; the lateral line runs from the gills to the tail, which at the abdomen is curved, but elsewhere is straight; its scales are very small, and adhere firmly to the skin; its roes are large; at the angle of the lower jaws there hangs a single beard, which is short, seldom exceeding a finger's length; its tongue its broad; it has several rows of teeth, like the pike; and in the palate, near the orifice of the stomach, and near the gills, it has small clusters of teeth. It has three back fins, two at the gills, and two at the breast, two others behind the anus, and the tail is plain.

These fish are found only in the seas of the northern parts of the world; and the great rendezvous for them are the sand-banks of Newfoundland, Novia Scotia, and New Fngland. These shallows are their favourite situations, as they abound with worms, a food that is peculiarly grateful to them. Another cause of their attachment to these places is their vicinity to the polar seas, where they return to spawn. There they deposit their roes in full security, and atterwards repair, as soon as the more southern seas are open, to the banks for subsistence; consequently the cod may justly be placed at the head of the migrating, or wandering tribes of fish. Few are taken north of Iceland, and the shoals never reach so far south as the straights of Gibralter.

Previous to the discovery of Newfoundland, the principal fisheries for cod were in the seas off Iceland, and off the western islands of Scotland. To the former of these the English resorted near four centuries, and had no fewer than one hundred and fifty vessels employed in the Iceland fishery in the reign of James I.

WHITING. (*Gadus*. Pl. 48.) The name of this fish arises from the silvery hue which pervades the whole body, which is long, covered with small, round, thin, silvery scales. The head ends in a point; the eyes, near which are the nostrils, are round, with a large black pupil, and silvery iris. The upper jaw is armed with several rows of teeth, of which those in front are the longest; the lower jaw has but one row. The back is olive colour, and arched, as is the belly. The sides are somewhat compressed, and the anus is nearer the head than the tail. The lateral line has a straight direction. The fins are white, except the pectoral and tail, which are blackish.

This fish is found in the Baltic and North Seas, though not numerous in the former; but they are plentiful on the coasts of Holland, France, and England, where they are reckoned the most delicate and wholesome species of the genus. They attain the length of a foot, sometimes one and a half, rarely two; but on the Dogger-bank they are caught of the weight of from four to eight pounds. They live at the bottom of the sea, feeding on little crabs, and worms, and young fry, particularly of spats and herrings; which therefore are the usual baits. They are caught usually with a ground-line, sixty-four fathoms long, with from a hundred to two hundred hooks. One vessel throws out about twenty of these lines, armed with four thousand hooks, and they need only lie about two or three hours. The greatest fishery for whitings is carried on in France from December to February; but in England and Holland in the spring. They appear in such quantities on the English coasts, as to form shoals of three miles long and a mile and a half wide; and, as they are caught in too great numbers to be eaten fresh, they salt them, by which however they lose the delicacy of their taste, and are then called buckthorn; they are often used in this state as ships' stores. As they pursue the herrings, they are often taken in the same nets; and are in greatest perfection at this time, because they are fattened by feeding on the young herrings. In October the roes and ovaries begin to swell; and they continue spawning from the end of December till the beginning of February; and about that time they become soft, lean, and insipid to the taste. They are pursued by all the rapacious tribes that inhabit the sea; yet they multiply fast.

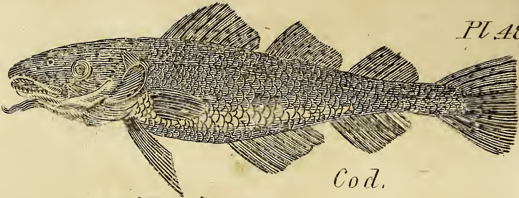
PIKE. (*Esox*. Pl. 48.) The head of the pike is very flat, the eyes small and of a gold tinge; the upper jaw broad and shorter than the lower which turns up a little at the end, and is marked with minute punctures; the teeth are very sharp, disposed not only in the point of the upper jaw, but in both sides of the lower, in the roof of the mouth, and has often three rows upon the tongue, and even down to the orifice of the stomach; the gape of the jaws is wide, although closely connected; they have on each side an additional bone like the jaw of a viper, which renders them capable of greater distention when the prey is swallowed; the body is long, the back broad and almost square when in its best state; the belly is always white. When in high season their colours are very fine, being green, spotted with bright yellow, and the gills are of a most vived red; out of season the green assumes a gray appearance, and the yellow spots turn pale. The dorsal fin is placed low on the back.

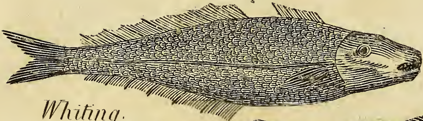
The pike has been poetically styled the tyrant of the watery plain; and, in fact, in proportion to his strength and celerity, he is the most active and voracious of the fresh water fish. He will attack every fish less than himself, and is sometimes seen choaked by attempting to swallow such as are two large a morsel. It is immaterial of what species the animal it pursues appears to be, whether of another or its own; all are indiscriminately devoured; so that every fish owes its safety to its minuteness, its celerity, or its courage: nor does the pike confine itself to feed on fish and frogs, it will draw down the water-rats and the young ducks as they are swimming about.

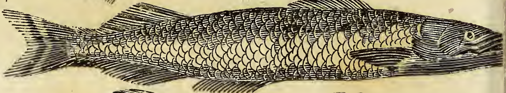
These fish afford the angler good sport, being bold biters. For trolling, the rod should be twelve or fourteen feet long. The best baits are gudgeons or dace of a middling size: the bait should never be thrown too far. Pike are to be allured by a large bait, but a small one is more certain to take them.

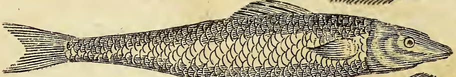
Herring. (*Clupea*. Pl. 48.) The common herring is distinguished from the other fish of the same tribe, by the projection of the lower jaw, which is curved, and by having seventeen rays in the ventral fin. The head and mouth are small, the tongue short, pointed, and armed with teeth; the covers of the gills generally have a violet or red spot, that disappears soon after the death of the fish, which survives a very short time, when taken out of its natural element.

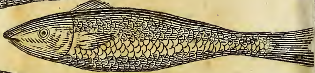
The principal of the British herring fisheries are off the Scotch and Norfolk coasts; and the fishing is always carried on by nets stretched in the water, one side of which is kept from sinking, by means of the buoys fixed to them at proper distances; and, as the weight of the net makes the side sink to which no buoys are fixed, it is suffered to hang in a perpendicular position like a screen: and the fish, when they endeavour to pass through it,

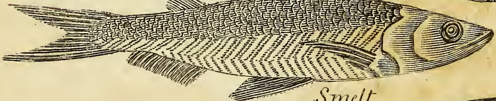

Cod.

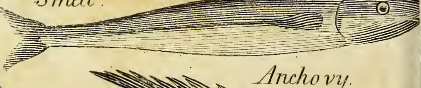

Whiting.


Pike.

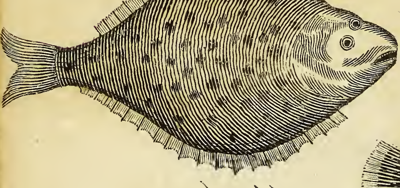

Herring.

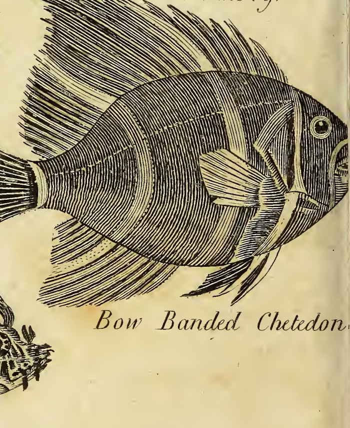

Sprat.

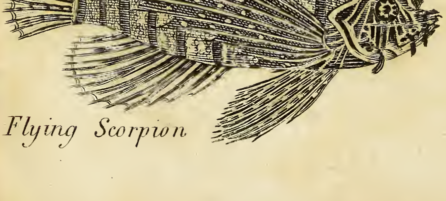

Smelt.


Anchovy.

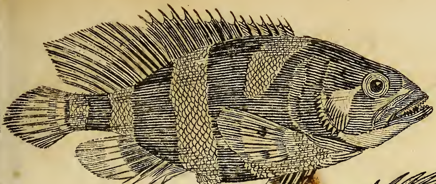
Turbot.




Bow Banded Chetedon.


Flying Scorpion

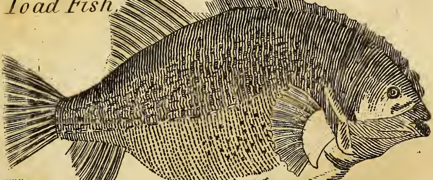
Pl. 49.



Lanceolated Holocenter.

Porcupine Fish.

Spotted Toad Fish.



Lump. Fish.

Sea Cock.

Ribbon Fish.

are entangled in its meshes, from which they cannot disengage themselves. There they remain till the net is hauled in, and they are shaken or picked out. The nets are never stretched to catch herrings but during the night, for in the dark they are to be taken in much the greatest abundance.

After the nets are hauled, the fish are thrown upon the deck of the vessel, and each of the crew has a certain task assigned to him. One part is employed in opening and gutting them, another in salting, and a third in packing them in the barrels in layers of salt. The red herrings lie twenty-four hours in the brine; they are then taken out, strung by the gills on little wooden spits, and hung in a chimney formed to receive them; after which a fire of brush-wood, which yields much smoke, but no flame, is kindled under them, and they remain there till sufficiently smoked and dried, when they are put into barrels for carriage.

Herrings become very soon tainted after they are dead; in summer they are sensibly worse for being out of the water only a few hours; and if exposed only a few minutes to the rays of the sun, they are quite useless, and will not take the salt.

SPRAT. (*Clupea.* Pl. 48.) The sprat is a native of the European seas, greatly resembling the herring, though a good deal smaller, and having thirteen rays in the back fin. They are caught in the Thames from the beginning of November till March, and afford a very seasonable relief to the poor of the metropolis.

Sprats are sometimes pickled, and rendered in flavour scarcely inferior to anchovies, from which they are only to be distinguished by their bones being indissoluble.

SMELT. (Pl. 48.) There are two species of this soft-finned, abdominal fish: which derives its name from having, in the opinion of some, the scent of a violet, of others, that of a cucumber; and so strange is the disagreement respecting the smell of this fish, that the Germans bestowed upon it the name of stink-fish.

The first species, called the hepsetus, has about twelve rays in the fin next the anus. It is found in the northern seas, and is very plentiful in the sea near Southampton, and on other coasts of Great Britain. The length is about five inches, and the tail is much forked. It is a beautiful little fish, semi-pellucid, covered with scales; the colour silvery, tinged with yellow; beneath the side line is a row of small black spots, and the under jaws rather prominent; in the front of the upper are four large teeth: the flesh is tender, and of a delicate taste.

The other species called the menidea, has twenty-four rays in the fin next the anus. This is a very small pellucid fish, with many black points interspersed: it has many teeth in the lips, but none in the tongue or jaws. It is found in the fresh waters of Carolina.—The skin of this fish is in general so thin, that with a good microscope the circulation of its blood may be seen.

The smelt is to be angled for (when the tide runs up is preferable) with a paternoster line, having five or six hooks as many inches from each other, and baited differently. The best baits are very small shrimps not boiled, or the tail of a boiled one; next to these are gentles and red paste; also that made of boiled shrimps, fine white bread, and a little honey, cadis blood worms; and they will sometimes take a bit of their own species. Some crumbs of bread should now and then be thrown in to keep them together.

These fish are taken in abundance in the Thames and Dee (England,) in November and the two succeeding months; in other rivers not until February.

Anchovy. (Pl. 48.) The anchovy is about three inches long, though mention is made of some being six inches and a half. The nose is pointed; the edge of the jaws finely serrated, the upper being longer than the under: the eyes large; the body round and slender; the back of a dusky green colour; the sides and belly of a silvery white; between the ventral fins it has a long pointed scale, and the tail is forked.

At different seasons it frequents the Atlantic ocean and the Mediteranean sea, passing through the Straights of Gibralter towards the Levant in the months of May, June, and July. The greatest fishery is at Gorgano, a small isle west of Leghorn, where they are taken at night in nets, into which they are allured by lights fixed to the stern of the vessels. When cured, their heads are cut off, their gall and intrails taken out, then salted and packed in barrels. It scarce needs to be mentioned, that, being put on the fire, they dissolve in almost any liquor. They are well tasted when fresh.—But it has been found by experience, that anchovies taken thus by torch light, are neither so good, so firm; nor so proper for keeping, as those which are taken otherwise.

Sole. This well known and delicious fish is remarkable for one very extraordinary circumstance; among various other marine productions, they have been known to feed on shell-fish, although they are furnished with no apparatus whatever in their mouths for reducing them to a state calculated for digestion. But the most usual food for soles, is the spawn and young of other fish.

These fish are found on all the British coasts; but those of the western shores are much superior in size to what are taken in the north, since they are sometimes found of the weight of six or seven pounds. The principal fishery for them is in Torbay.

Turbot. (Pl. 48.) The turbot like some others of the flat-fish, grows to a great size. Flat-fish swim side ways, on which account they are styled pleuronectes by Linnæus. The eyes of all of them are situated on one side of the head, and it is a curious circumstance, that while the under parts of their body are of a brilliant white, the upper parts are so coloured and speckled, as when they are half immersed in the sand or mud, to render them imperceptible. Of this resemblance they are so conscious, that whenever they find themselves in danger, they sink into the mud, and continue perfectly motionless. This is a circumstance so well known to fishermen, that within their palings on the strand they are often under the necessity of tracing furrows with a kind of iron sickle, to detect by the touch what they are not otherwise able to distinguish.

The manner of fishing for turbot off the Yorkshire coast, is as follows; three men go out in each of the boats, each man provided with three lines; every one of which is furnished with two hundred and eighty hooks, placed exactly six feet two inches asunder. These are coiled on an oblong piece of wicker-work, with the hooks baited, and placed very regularly in the centre of the coil. When they are used, the nine are generally fastened together so as to form one line with above two thousand hooks, and extending near three miles in length. This is always laid across the current. An anchor and buoy are fixed at the end of each man's line. The boats for this purpose are each about a ton burthen; somewhat more than twenty feet in length, and about five in width. They are well constructed for encountering a boisterous sea, and have three pair of oars, and a sail, to be used as occasion requires.

The general bait used for taking turbots is fresh herring cut into proper sized pieces, which they bite most readily; they are also partial to the smaller lampreys, pieces of haddock, sand-worms, muscels, and limpets; and when none of these are to be had, the fishermen use bullock's liver. They are so extremely delicate in their choice of baits, as not to touch a piece of herring or haddock that has been twelve hours out of the sea.

Bow Banded Chetedon. (Pl. 48.) The head of this curious fish is large; the eyes placed near the top, and small; the pupil black, iris gold yellow. The aperture of the gall is wide, and at the covert there is a spine. The lateral line is made up of white dots. The ground colour is brown, which towards the back inclines to black; and looks as if covered with velvet, and inlaid with ivory. The tail is not divided. This species inhabits the coasts of Brasil, and other parts of South America; and grows from three to six inches in length.

In winter or the rainy seasons, they lie in deep holes near the shore, which they quit in spring to come into the shallows near the land: during the summer, when the sun in those climates blazes the whole day with irresistible fierceness, they keep at the depth of twenty or thirty yards, which protects them from its intense heats.—

They spawn in the coolest time of the year: and being a lively fish, great numbers of the young fry are caught for the sake of being kept in vases, but in which they seldom come to maturity, and never increase.

Flying Scorpion. (*Scorpæna.* Pl. 48.) The head of this fish is truncated, broad in front, compressed at the sides, furnished with pretty large spines and fringed barbles; the longest of these are over the eyes, and the broadest near the corners of the mouth: there are several brown stripes on the body and head; with yellow and white streaks alternately shining between: the mouth is large; the jaws of equal length, and armed with a great number of little sharp teeth: the tongue is loose, thin, and pointed at the end; the lips are moveable also; the upper lip is composed of two bones, which form a furrow in the middle where they join. The nostrils are single, and lie midway between the mouth and eyes. The eyes have a black pupil, and a white iris with blue and black rays. The gill-covert terminates in a sharp angle, and is furnished with very minute scales; the aperture is wide, and the branchial membrane is in great part naked. The scales on the body are small, and lie one over the other like tiles on a house: the lateral line consist of little risings and white points: the rays of the pectoral fins are simple, and the membrane has a violet ground with white dots; these large fins probably enable the fish to dart out of the water when pursued by an enemy. The first twelve rays of the dorsal fin are spiny, spotted brown and yellow; united below by a dark brown membrane, and at liberty above; the last twelve rays, as well as those of the anal and tail fins, are divided at the ends, and spotted black and yellow. The ventral fins are violet, with white dots; the first ray is hard.

This variegated fish is found in the rivers at Amboyna and Japan; but even there it is scarce. It is known also at Tranquebar. The flesh is white, firm, and well tasted, like our perch, but it does not grow so large. It is of the voracious kind, feeding on the young of other fish: entire fishes of two inches and a half long have been found in the stomach. The skin is like parchment.

Lanceolated Holocenter. (Pl. 49.) The head is large, with a mouth in proportion; the bones of the lips are broad; the jaws are of equal length, and armed with several rows of little sharp teeth; as is the palate, but the tongue is smooth and moveable. The nostrils are double, the hinder pair near the eyes. Hereabout begin the scales, which are small, tender, and smooth.—The pupil of the eye is black, iris blue. The front operculum is made of two small rounded plates, of which the hinder one is strongly serrated. The gills have a wide aperture, and one half of the membrane is concealed. The body is broad, the belly prominent, and the anus in the middle of the body. The colour of the fish is silvery with transverse stripes and spots of brown. The soft rays of the fins are mostly divided into four branches. This species is produced in the East Indies, and takes its name from the shape of the fins.

On the coasts of Africa and America, and in the waters of the East Indies, are found several varieties of the holocenter, which are remarkable for the brightness of their colours; and are known by the structure of their mouths to be carnivorous. They mostly prey on crabs and young fish, which they swallow whole. Their flesh is much esteemed by the natives, it being pleasant and wholesome food.

Porcupine Fish. (Pl. 49.) The head is small; the eyes large, with a black pupil and yellow iris: the nostrils are near the eyes. The aperture of the gill is crescent shaped, and close to the pectoral fin. The back is of a bluish colour, sides and belly white. The fins are all short, with black spots and branched rays; and the body is covered with light and dark brown spots. The spines are longer on the sides than on the back and belly.

This species is found not only in America, but in the Red Sea, and near the shores of Japan. At New York, where it appears only in the summer months, it goes by the name of goad-fish; and the natives fish them for amusement. They throw in a line baited with the tail of a sea-crab; the fish approaches, but, being afraid of the line, he makes several turns and trials round the bait, and at length nibbles at it, but pretends to reject it, and passes by, striking it with his tail, as if he did not regard it. But if the rod be kept steady, he presently turns back, seizes the bait, and swallows hook and all. When he finds himself taken, he becomes enraged, bristles up his spines, swells out his belly, and endeavours to wound every thing that is near him. Finding this of no avail, he resorts to cunning, and seems to submit: he lowers his spines, contracts his body, and lies like a wet glove. But this artifice not succeeding, and perceiving the fisherman dragging him towards the land, he renews his defensive attitude with redoubled fury. The spines are now vigorously erected, its form rounded, and its body so completely armed at all points, that it is impossible to take it by the hand; it is therefore dragged to some distance, where it struggles and quickly dies.

Spotted Toad Fish. (Pl. 49.) The head is small; the lower jaw protrudes beyond the upper, both furnished with very small teeth like a file; in the middle there is a small cartilage, which serves instead of a tongue; the lips, and indeed many other parts of the body, send out barbles. The body is laterally compressed, and exasperated with crooked spines: the head and back are broad in front, but go tapering towards the tail; the belly is thick and swelling out. From the upper lip shoots out an elastic barble, at the end of which are two long fleshy substances which seem as if formed for holding prey; behind this barble is another fleshy ray, and stronger, and between that and the dorsal fin, another still thicker; both are fastened to the back by a skin; these instruments help this clumsy slow-swimming animal in catching its prey. The nostrils are near the mouth; they are round; they have a black pupil, and the iris is yellow striped with brown.

This fish is yellow on the sides and back, brown on the belly. The body and fins are varied with stripes and spots of brown colour, and of different shapes; the stripes are broad in some subjects, in others only strokes;

some have white spots, others brown edged with white. The pectoral and ventral fins give this animal the look of a quadruped, but the other fins shew it to be a fish. It has no lateral line, any more than the rest of the genus. The skin on the belly is thin, and only fastened to the flesh here and there by little bandages.

This fish is found in Brazil and China; it generally keeps at the bottom of the water among sea-weed, or between stones, and grows to the length of nine or ten inches.

Lump Fish. (Pl. 49.) This fish is remarkable for its big belly, which is swelled out by a large double urinary bladder. The mouth is in the upper part of the head, and very wide; the teeth are numerous, but stand without order: the gill-coverts are fastened to the aperture almost all round: the skin is covered with a thick mucus; all its parts are flabby and loose: the upper surface is mostly of an olive colour. This species is found in the sea which separates Kamtshatka from North America; it seldom exceeds a foot in length.

Sea Cock. (Pl. 49.) The body of this fish is very thin, of a silver colour, inclining to red, and without visible scales. The head is large, very much shelving; the mouth large; the jaws are furnished with very small teeth, and the upper lip with two large bones. The nostrils are double, and near the eyes, which are round and large; the pupil is black, the iris brown inclining to a silver gray: the opening of the gills is large; the covert is long, consisting of one plate, under which the membrane is hid. The lateral line is crooked at is origin; the anus is not far from the ventral fins. All the fins are of a bright green colour; in the dorsal fin, the nine first rays are short and hard, the next four long and soft, and both are single; the pectoral, ventral, and tail fins are branched.

This fish lives in all climates, being found, according to different authors, at Brasil, Jamaica, the Antilles, the East Indies, and Malta. It grows from six to nine inches in length, is well tasted, and lives upon worms, insects, and other little marine animals.

**Ribbon Fish.** (Pl. 49.) The head of this fish is broadest at top; the mouth large, opening obliquely: the under jaw is the longest, and both are armed with sharp teeth, one row in the upper, two in the lower: the tongue is thin, broad, and rough: the eyes are large, standing at the top of the head; the pupil is black, the iris silver mixed with blue; there is a round hole in the inner edge of each eye: the aperture of the gills is wide: the covert single; before the aperture are five minute holes, and several of the same kind near the eye: they probably secrete a viscous or slimy matter. This fish has an extremely slender and tapering shape; the body being twelve inches in length, and scarcely one in thickness: it is of a sivery colour, and semi-transparent. The pectoral fins are small, and their rays so slender, that they are almost imperceptible. About an inch behind the head, rises the doral fin, which is continued till it joins the tail, where it meets the anul fin, which begins so near the throat, that the anus is situated immediately below the angle of the lower jaw. The fins display a great brilliancy of colour, being of a most beautiful red, with five spots of a deeper or brighter cast, placed on each side of the body: the tail is wedge shaped: the head is of a silver colour mingled with red; the back is gray; the sides and belly silvery.

This fish is found in the Mediterranean; it is sold in the markets of Rome; but its flesh is of an indifferent quality, and very lean. It is mostly used for bait. It lives on young crabs and other small shell-fish. It haunts marshy places near the shores: and may be caught with a line baited with a worm, or the shell of a crab.

**Flying Fish.** (*Exocœtus.* Pl. 50.) The winged flying fish, if we except its head and flat back, has, in the form of its body, a great resemblance to the herring. It is generally nine inches long, and full four round at the thickest part. The skin is uncommonly firm, and the scales are large and silvery. The pectoral fins are very long; and the dorsal fin is small, and placed near the tail, which is forked. The eye, in consequence of the largeness of the head, is admirably suited for discovering danger or prey; and when pushed out of the socket, which the fish can do considerably, its sphere of vision is greatly increased.

The flying fish inhabits the European, the American, and the Red Seas: but is chiefly found within the tropics. The wings, with which they have the power of raising themselves into the air, are nothing more than large pectoral fins, composed of seven or eight ribs, or rays, connected by a flexible, transparent, and gluttinous membrane. They have their origin near the gills, and are capable of considerable motion backwards and forwards. These fins are used also to aid the motion of the fish in the water; and if we are to judge from the great length and surface of the oars, comparatively with the size of the body, the fish should be able to cut their way through the water with great velocity.

In flying, as it is termed, not only the wings and fins of these fish are much expanded, but also their tails; they skim along the surface of the deep, somewhat in the manner of a swallow, but in straight lines; and, from the blackness of their backs, the whiteness of their bellies, and forked expanded tails, they have much the same appearance. They fly fifty or sixty yards at one stretch; and repeat the exertion again and again by a momentary touch on the surface of the water, which gives them vigour for a new departure.

It has been inconsiderately remarked, that all animated nature seems combined against this little fish, which possesses the double powers of swimming and flying only to subject it to greater dangers. If it escape its enemies of the deep, it is only to be devoured by the sea fowl, which are waiting its appearance in the air. Its destiny is, however, by no means peculiarly severe: we should consider that, as a fish, it often escapes the attack of birds; and, in its winged character, the individuals often throw themselves out of the power of the aquatic race.

Remora, or Sucking-Fish. (Pl. 50.) There are only three known species of the sucking-fish; these are occasionally seen in the Mediterranean sea and the Pacific ocean. The common sucking-fish, which inhabits most parts of the ocean, is usually about a foot in length; the head large, equal in bigness to the body, which grows smaller gradually to the tail.

The back is convex and black, and the belly white. It has six fins, two growing from behind the gills, two more under the throat, a long one on the back, and opposite to it under the belly, another of the same form and size; the tail is wedge-shaped.

What this fish has peculiar to itself is, that the crown of the head is flat, and of an oval form, with a ridge, or rising, running lengthways; and crossways to this, sixteen ridges, with hollow furrows between, by which structure it can fix to any animal or other substance, as they are often found adhering to the sides of ships, and the bodies of sharks and other large fish.

Sucking fish are often eaten, and much admired: in taste they are said very greatly to resemble fried artichokes.

STRAKED GILTHEAD. (*Sparus*. Pl. 50.) The head of this fish is compressed, and bare of scales as far as the eyes: the mouth is large; the jaws are of equal length, with two strong canine teeth in front of each; the back teeth are flat, resembling the grinders of quadrupeds; the palate and tongue are smooth. The nostrils are single; and near the eyes; these last are small, with a black pupil in a blue iris. The aperture of the gills is wide, and the membrane mostly uncovered. The body is of a yellow colour, with six or seven brown transverse stripes. The scales are broad, thin, smooth, and extend over part of the anal, tail, and dorsal fins. The lateral line goes straight along the back to the end of the dorsal fin; it begins again about the middle of the tail, and is lost in the fin. This fish inhabits the shores of Japan, and the Red sea.

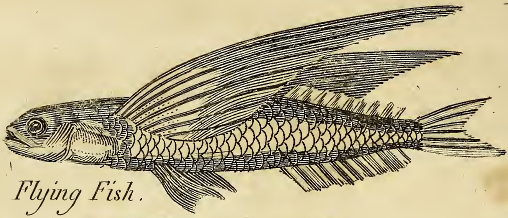
FOUR-EYED LOACH. (Pl. 50.) The head of this species is broader than high, and fore shortened; the lower jaw is the longest, and it lengthens downwards, not in front like other fish. Both jaws, as well as the palate and tongue, are armed with teeth; the barbles arise from the corners or extremities of the upper lip. The nostrils are single, and near the mouth. The eyes are very remarkable: each containing two parts or a double pupil, which has caused it to be called four eyes. The cavity of the eyes differ from other fish: this cavity is not a cylinder, as in other animals, but a part of one only ; on each side of the top of the head there is an arched thin bone advancing towards the scull; these bones face each other with their concave surfaces; the eye is cylindrical, and is fixed in this cavity, but rises above it: the pupil is seen above the surface, enclosed in a black iris; as the corner is equally luminous in the internal part, the pupil is seen double. The gill coverts are smooth and slippery; the body upwards is broader than it is thick; but it takes a rounded form towards the tail. The sides are ornamented with five longitudinal dark brown stripes; they run quite to the tail, where the two outmost are connected by a transverse stripe, and the three middlemost by another. The lateral line is scarcely visible; the anus is nearer to the tail than to the head. The dorsal fin is small, and near the tail. All the fins, except the ventrals, are covered mostly with small scales; on the body the scales are larger. It is viviparous like the whale, and produces its young alive.

This singular fish is found in the rivers of Surinam. It multiplies fast, and is esteemed by the inhabitants as good food; it grows from six to ten inches in length.

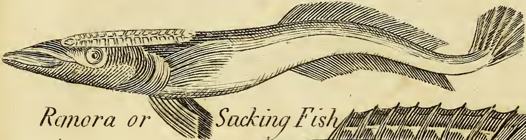
Of the loach kind of fish, there are eleven different species ; but finding our limits will not permit us to give the history of them all, we have inserted the above as being the most curious.

TELESCOPE FISH. (Pl. 50.) The whole body of this fish, and the ground colour of the fins, are of a beauful red, darker towards the back, and lighter towards the belly; the membranes of the fins are almost white, and the red rays shining through them have a very fine effect : the three white points of the tail form to the idea, a trident, or a tulip. The head is short but large, the mouth is small, the nostrils single. The pupil of the eye is black, the iris yellow; the back is round; the lateral line nearer the back than the head. The scales are

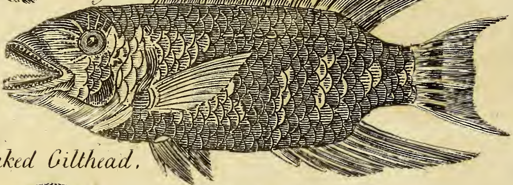
Pl.



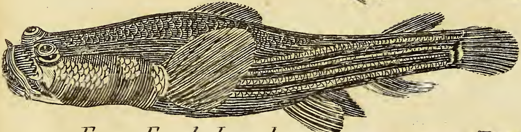
Flying Fish.



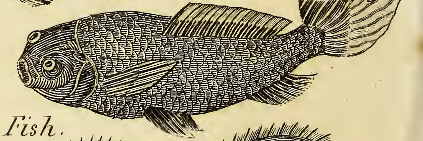
Remora or Sucking Fish



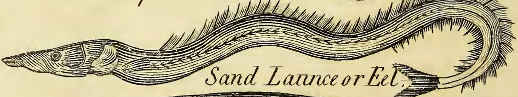
Straked Gilthead.



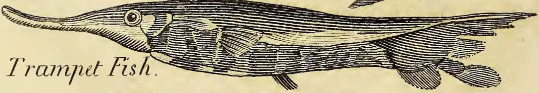
Four Eyed Loach.



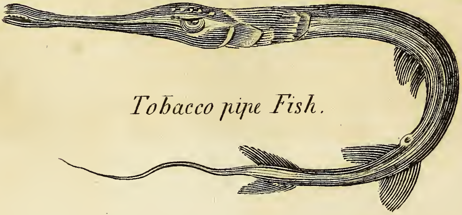
Telescope Fish.



Sand Launce or Eel.



Trumpet Fish.



Tobacco pipe Fish.

large; the rays of the fins ramified. This beautiful fish is found in the fresh waters of China, and is supposed to be a variety of the gold fish.

White Bait. This fish has a great similarity to the bleak, and during the month of June, appears in the Thames, near Blackwall and Greenwich. The usual length of this small species is two inches; the dorsal-fin is placed near the head, so that, when suspended by it, the tail sinks down; the tail is forked and black on the tips. These small fry are usually caught for the purpose of bait for other fish. When fried with flour, they are reckoned a delicious viand by the lower order of epicures, who frequent the taverns contiguous to the places where they are taken.

No naturalist has determined to what particular fish this belongs, though all are agreed that it is the young of some species that resort there. Some have ascribed its origin to the shad; others to the sprat, the smelt, and the bleak. These fish, however, are all found in other streams, while the white bait is peculiar to the river Thames.

Sand-Launce, or Eel. (*Muræna*. Pl. 50.) The head of this fish is oblong, laterally compressed, and thinner than the trunk; the upper lip double; no teeth, but in the throat are two rugged bones, of an oblong shape, destined to retain the food. The aperture of the gills is wide. The cheeks, sides, and belly, are of a silver colour; the nostrils are double, lying midway between the eyes and mouth. The eyes are small, having a black pupil within a silvery iris. The back is round, has a furrow destined to receive the long dorsal-fin. The anus is nearer the end of the tail than the head; the lateral line goes straight along the middle of the trunk; but there is another nearer the back, and still another near the bottom of the belly. The rays of all the fins are soft, and united by a thin membrane; they are simple in the dorsal and anal fins, and divided at the ends in the pectoral and tail, which last is bifurcated.

This fish is found in the North Sea and the Baltic; and is frequently dug out of the sand near the British shores. The sand is its usual dwelling, from whence it derives its name; it lies sometimes a foot or two from the surface. It lives on water-worms, which it digs up with its sharp snout; it feeds also on the young of its own species, and some of about two inches long have been found in its stomach. It rarely comes to the surface of the water; but in fine weather it may be seen coiled up like a snake, with its head pressed into the sand. The voracious fish are its destroyers, especially the mackerel. They spawn in May, laying their ova on the sands not far from the shore. They are dug out of the sands at the reflux of the tide, with hooks made on purpose; they are mostly used for bait, though sometimes eaten.

Some naturalists say they are thin and dry, and very indifferent food; while others assert that they are delicate eating. The Greenlanders eat them both fresh and dried, but more frequently bait their hooks with them: the scales to these fish are very small and thin.

Trumpet-Fish. (Pl. 50.) The body of this fish is short and broad, laterally compressed, and very much resembles a pair of bellows in shape; it is of a pale red colour: the head which is broadish above, ends in a bent cylinder below; and the aperture of the mouth, which is small, is at the end of the long beak; the aperture is closed by the lower jaw, which shuts into the upper like the lid of a snuff-box: the nostrils are double, and lie near the eyes; the eyes are large, with a black pupil and a pale-red iris: the gill-covert is single: the aperture is large, and covers the the membrane which lies underneath. This fish can hide its small ventral fins in a furrow which lies behind them: all the fins are of a gray colour. This fish haunts the Mediterranean sea; it is tender, well-tasted, and easy of digestion; but, being very thin, it is generally sold with other small fish at a low price. As the fins are very small in proportion to the other parts, so that it cannot swim fast enough to avoid its enemies, Providence has given it a moveable serrated spine for its defence, which is the first ray in the dorsal fin; with this it will successfully defend itself against almost any fish, unless taken by surprise.

Tobacco-Pipe-Fish. (Pl. 50.) This species is known in the seas of both Indies and at Brazil. The head is very long, quadrangular, and adorned with rays. The aperture of the mouth is wide, and in an oblique direction; the lower jaw is somewhat longer than the upper; the teeth are small; the tongue moveable; the nostrils double, and near the eyes, which are large, with a black pupil and silvery iris. The body is devoid of visible scales, flat in the front part, and rounded towards the tail. The lateral line has a straight direction. The anus is much nearer the tail-fin than the head; the belly is long; the fins short, the rays mostly four-branched. This fish is brown, spotted with blue on the back; the sides and belly silvery; the fins are red.

It grows three or four feet long, living on small fry and lobsters; it is very plentiful, but lean, therefore only eaten by the poor.

Netted Eel. (Pl. 51.) The head and mouth of this beautiful species is small, without barbles. The eyes are near the upper lip, of a blue and white colour. The teeth stand apart from each other, and those in front are the longest. The body is variegated with black and white spots like net work, and the dorsal fin extends the whole length of the back.

This species is from two to three feet in length, and was found near the coast of Tranquebar; but little is known of its natural history.

Common Eel. This forms evidently a connecting link, in the chain of nature, between the serpents and fish, possessing not only, in a great measure, the serpent form, but also many of their habits.

This fish is frequently known to quit its element, and to wander, in the evening or night, over meadows in search of snails and other prey, or to other ponds for change of habitation. This will account for eels being found in waters that have not been in the least suspected to contain them. The usual haunts of eels are in mud, among weeds, under roots and stumps of trees, or in holes in the banks or the bottom of rivers. They are partial to still water, and particularly to such as is muddy at the bottom.

Eels are best in season from May to July, but may be caught with a line till September. When the water is thick with rains, they may be fished for during the whole day; but the largest and best are caught by night lines. The baits generally used, are wasp-grubs, dew worms, minnows, and gudgeons.

The common eel seldom exceeds a foot in length. The head is compressed, and narrower than the body; the upper jaw is narrower than the under, and the body is cylindrical, with scales hardly perceptible.

Cordated Eel. (*Murœna.* Pl. 51.) This fish inhabits the West-India seas; its whole length is about thirty-two inches, of which the process at the end of the tail measures twenty-two; body rich silvery, flexible part belonging to the snout brown, fins and caudal process paler brown. Snout connected to the back part of the head by a flexible leathery duplicature, which permits it to be extended so that the mouth points upwards, or to fall back so as to be received into a sort of case formed by the upper part of the head; eyes close to each other, and with short columns, clear chesnut-brown, with a coppery gloss: below the head on each side, is a considerable compressed semicircular space, the forepart of which is bounded by the gill-cover, which seems to consist of a moderately strong membrane; body gradually diminishing as it approaches the tail, which terminates in a process or string of enormous length, ending in a very fine point; pectoral fins small, situate behind the cavity on each side the thorax, caudal fin with five spinous rays.

Butterfly-Fish. (Pl. 51.) The head is long, narrowed at the sides, and large. The eyes are large, prominent, with black pupil, and orange-coloured iris; the mouth is large; the jaws are of equal length, with a row of very narrow teeth standing close to each other; the tongue is broad, but short. The gills wide, the cheeks are large, and of a silver colour. The back is round, and of a dark green; the belly is short but broad. The ground colour of the fish is a dirty green, with brown spots; there are some however, whose principal colour is a clear blue. This fish inhabits the Mediterranean sea: and at Marseilles, Sardinia, and Venice, is common in the markets with other small fish. It attains to the length of six or eight inches; the flesh is lean, therefore not much esteemed. It lives near the shores, among the rocks and weeds; and feeds on crabs and small shell fish. Its scales are hardly visible. Some naturalists describe this fish as having two dorsal fins; while others say it has but one. This contradiction must arise from these fins being sometimes united by a membrane, and sometimes not.

The Dace. (*Cyprinus.*) This fish has a lengthened body, small head, middling-sized scales, gray fins, forked tail, and the lateral line curved downwards. The fish is of a silver colour, except the back, which is brownish, and rounded. The pupil of the eye is black, iris yellow; and near the organs of hearing and respiration. The aperture of the mouth is middle-sized; the coverings of the gills are two thin laminæ. All the fins are white. This fish is found in the south of Germany, as well as in France, Italy, and England.

Great Cuttle-Fish. (*Sepia.* Pl. 51.) This curious and singular creature, is furnished with eight arms or claws, interspersed on the interior side with little round serrated cups, by the contraction of which, the animal lays fast hold of any thing that comes in its way. Besides these eight arms, it has two others longer than the preceding, and also pedunculated. The mouth is situated in the centre, and is horny, and hooked like the bill of a parrot. The eyes are below, and surrounded with several silvery rings; they are as large as the eyes of a calf, but are very prominent, and rather resemble the eyes of the crab. The body is of a reddish brown colour, nearly cylindrical. The belly below is equal, soft, smooth, oblong-round, of an ash and faintly-yellowish colour: about the middle of the upper part of the body, there is a fin, like those of fishes, composed of a softish cartilaginous substance, spread out widely on both sides, and decreasing towards the tail till it ends in a point, like the broad fins of the ray-fish; by means of this fin it moves itself in swimming, having no other membrane for that purpose From this pointed termination of the tail, the French call it the sea-spider, although it has scarcely any resemblance to the spider; but rather with respect to the head, approaches to the shape of the star-fish. At any rate they are very formidable animals. With their arms and trunks they fasten themselves, to resist the motion of the waves. The females lay their eggs upon sea-weed and plants, in clusters like bunches of grapes. Immediately after they are laid they are white, and the males pass over and impregnate them with a black liquor, after which they grow larger and resemble black grapes. On opening one of the eggs, the embryo cuttle is found alive.

The noise of a cuttle-fish, on being dragged out of the water, resembles the grunting of a boar. When the male is pursued by the sea-wolf or other ravenous fish, he shuns the danger by stratagem. He squirts out a black liquor, by which the water becomes as black as ink, under shelter of which he baffles the pursuit of his enemy. This black liquor is elaborated in a particular gland. The Romans used it as ink; and it is said to be an ingredient in the composition of Indian ink. The back-bone of this animal is converted into that useful article of stationary called pounce. In hot climates these creatures are found of an enormous size. The Indians affirm, that some have been seen two fathoms broad over their centre, and each arm nine fathoms long. When the Indians navigate their little boats, they go in dread of them; and, lest these animals should fling their arms over and draw them under water, they never fail having an adze to cut them off. When used for food, they are served up in their own liquor, which from boiling, with the addition of nitre, becomes red. If taken into a dark apartment and cut open, it illuminates the whole place.

ECHINUS, or SEA-URCHIN. (Pl. 51.) This species of the sea-urchin, is numerous: its shape is hemispherical oval, with ten winding avenues; the spaces between each, are armed with strong prickles and warts. It inhabits the Southern Seas; and is valued as a nourishing and savoury food. Most of this species of fish, have a great variety of beautiful tints and curious forms, many of which are highly valued in collections.

**Lobster.** (Pl. 51.) The common lobster has a smooth thorax; short serrated snout, very long antennæ, and between them two shorter ones; bifid claws, and fangs large, the greater tuberculated, the lesser serrated on the inner edge; four pair of legs, six joints in the tail; tail fins rounded. The pincers of one of the lobster's large claws are furnished with knobs, and those of the other are always serrated. With the former it keeps firm hold of the stalks of submarine plants, and with the latter it cuts and minces its food very dexterously. The knobbed, or numb claw, as the fishermen call it, is sometimes on the right, and sometimes on the left side indifferently. It is more dangerous to be seized by them with the cutting claw than the other; but in either case, the quickest way to get disengaged from the creature is to pull off its claw.

Like the rest of their tribe, they annually cast their shells. Previously to their putting off the old one, they appear sick, languid, and restless. They acquire an entirely new covering in a few days; but during the time that they remain defenceless they seek some lonely place, lest they should be attacked and devoured by such of their brethren as are not in the same weak situation. At the same time that they cast their shell they change also their stomach and intestines.

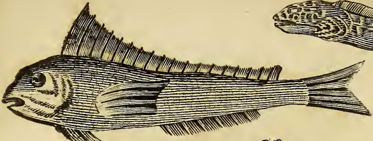
These animals are found on most of the rocky coasts of Great Britain. Some are caught with the hand, but the greater quantity in pots; a sort of trap formed like a wire mouse-trap, so that when the lobster gets in, there is no return. They are fastened to a cord sunk into the sea, and their place is marked by a buoy.—They were caught in such plenty on the coast of Northumberland, that about the year 1769, the sum paid for the annual exports from Newbiggen and Newton by sea, amounted to near fifteen hundred pounds.

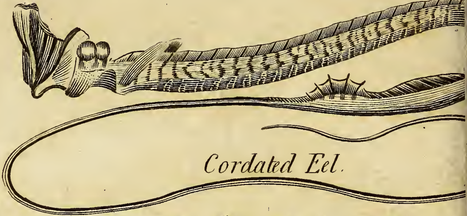
**Soldier Crab.** (Pl. 51.) The hands or feelers of this shell fish are smooth and hairy, the left one largest. The tail is furnished with a hook, by which it secures itself in its lodging. They inhabit the empty cavities of turbinated shells, changing their habitation, according to their increase of growth, from the small nerite to the large whelk. Nature denies them the strong covering behind, which it hath given to others of this class, and therefore directs them to take refuge in the deserted cases of other animals. They crawl very fast with the shell on the back; and, at the approach of danger, draw themselves within the shell, and, thrusting out the larger claw, will pinch very hard whatever molests them. This is called the soldier, from the idea of its dwelling in a tent. It is very diverting to observe these animals when they have occasion to change their shell. The little soldier is seen busily parading the shore along that line of pebbles and shells which is formed by the extremest wave, still however dragging its old incommodious habitation at its tail, unwilling to part with one shell, even though a troublesome appendage, till it can find another more convenient. It is seen stopping at one shell, turning it, and passing it by; going on to another, contemplating that for a while, and then slipping its tail from its old habitation to try on the new; this is also found to be inconvenient, and it quickly returns to its old shell again. In this manner it frequenly changes, till at last it finds one light, roomy, and commodious; to this it adheres, though the shell be sometimes so large as to hide the body of the animal, claws and all. When this animal is taken, it sends forth a feeble cry endeavouring to seize the enemy with its nippers; which, if it fastens upon, it will sooner die than quit the grasp.

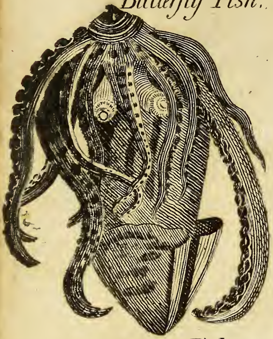
Crab. (Pl. 51.) The common crab has three notches on the front; five serrated teeth on each side; the claws elevated; the next joint toothed; the hind feet subulated: the colour a dirty green, but red when boiled. It inhabits all our shores, and lurks and burrows under the sand. It is sold, and eaten by the poor of our capitals.

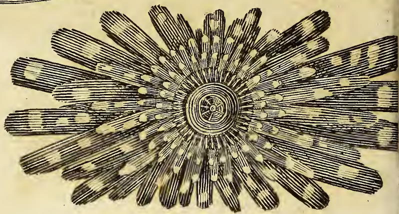
There are varieties of this kind of fish, each of which annually sheds its shell, like the lobster.

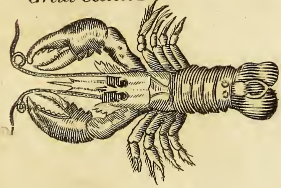
Netted Eel.

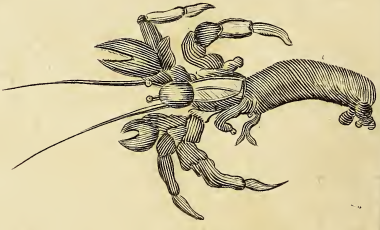

Butterfly Fish.


Cordated Eel.

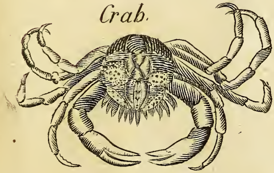

Great Cattle Fish.


Echinus or Sea Urchin.

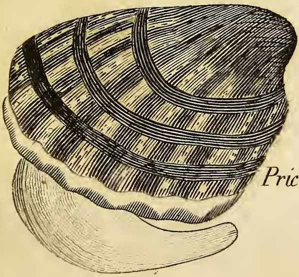

Lobster.


Soldier Crab.

Crab.



Shrimp and Prawn


Prickly Cockle.

Shrimp and Prawn. (Pl. 51.) Shrimps possess long slender feelers and between them two projecting laminæ; the claws have a single hooked moveable fang; they have three pair of legs; seven joints in the tail; the middle caudal fin subulated, the four others round and fringed; a spine on the exterior side of each of the outmost. These animals inhabit the shores of Britain in vast quantities, and are the most delicious of the genus.

The prawn is not unlike the shrimp, but exceeds it in size, being at least three times as big; and in colour, having, when boiled, the most beautiful pink tint all over its body. The flesh is better tasted than that of the shrimp, and both seem to be the first attempts which nature made when she meditated the formation of the lobster.

Prickly Cockle. (Pl. 51.) The shape of the cockle shell is slightly heart shaped, with spinous ribs; it inhabits the European seas, is of a white or tawney colour, with white bands; the grooves deep, about eighteen, and wrinkled near the hinge; the prickles grow larger from the middle towards the circumference.

The cockle is represented in the plate with the foot or hook protruded, in order to take its nourishment; and by the help or elastic power of which it can jerk itself from place to place; and in this manner, when it happens to be left by the tide, it regains its proper element. If touched ever so gently when lying in this attitude of evident enjoyment, it withdraws the hook and closes in the twinkling of an eye. Lobsters and crabs lie in wait for this opportunity of thrusting in a leg or a claw, whereby they kill and secure the cockle for food; but it often happens that the younger ones of those crustaceous animals not being sufficiently hardened or matured to withstand the violent snapping of the shells on their close, lose the limb; and herein we see the abundant wisdom and the benignity of the Almighty, in having bestowed on the cancer tribe the power of renewing their members when cut off; and, but for which, the whole race would soon become extinct, since this mode of procuring their living subjects them to eternal warfare.

OYSTER. (*Ostrea.*) This genus comprehends the two extensive families of pectens or scallops, and oysters; and there are no less than a hundred and thirty-six species in the whole. In both divisions, the animal is well known as a nutritive and valuable food. Both scallops and oysters are found plentifully in the Indian Seas, the Mediterranean, the American ocean, and in the European seas, where they constitute a considerable article of commerce. The scallops grow a sort of coarse byssus; and have the agility of leaping full half a yard out of the sea, at which time they open their shells, and spout out the stale water within them; after which they rapidly sink, taking in fresh water, and closing their shells with a loud snap, which betrays their beds to the watchful fisherman.

The difference between the oyster and the scallop is obviously impressed by the hand of nature; but its movements both in the water and out are still more contrary—for when left dry by the tide, by a sudden closing of its valves, assisted by the foot, it has the power of springing four or five inches at a jerk, repeating this motion in order to regain its element. In the water, it has the power of rising and sustaining itself near the surface, turning about in various directions, and on any alarm suddenly closing the valves and sinking to the bottom.—The oyster, on the contrary, is unfurnished either with a foot or with byssus; and its powers of motion consist only in turning either the flat or convex side upwards or downwards; and even to effect this, the animal is said to take advantage of the force of the ebbing or flowing of the water to assist it.

The oyster excludes its young completely formed; and by the help of a magnifier, the joinings of the little infant shells can be distinctly seen, with all their parts as perfect as the parent animal, though appearing to the naked eye only as a minute point.

# OF REPTILES.

## GREAT SEA SERPENT.

We shall commence this section with an account of the Great Sea Serpent.

This very extraordinary animal, which lately occupied the public attention in a high degree, and excited the curiosity of every class of people in this country, has at length assumed a scientific rank in the grade of animals on classical record. For this, we are indebted to the persevering industry and ingenious researches of that respectable and honourable institution, the *New England Linnæan Society*, who have conferred a lasting obligation on the scientific world by this very valuable deposit in the archives of natural knowledge. From a careful perusal of the documents supplied by the committee of the institution, there appears but little doubt remaining, that this mammoth prodigy properly belongs to the class of *Amphibia*, order of *Serpentes:* but its generic characters are entirely new; it therefore justly claims an independent rank in the zoological list. The committee have, therefore, very properly denominated the enormous reptile, the SCOLIOPHIS ATLANTICUS. They were induced to confer this name upon it, from a consideration of the flexuous structure of the spine, which is very remarkable, and different from that of all animals hitherto known. We shall, therefore, introduce this creature under the generic formula, which the committee have devised, after having made some prefatory observations.

The natural history of this creature of course is but little known. It appears to be migratory; and to pursue the schools of small fish, such as mackerel, herring, &c.

upon which without doubt it feeds; and it is highly probable that it pursues them to their annual retreats, within the arctic regions. From circumstances which will be hereafter noticed, it would appear that the object of feeding was not its only inducement to range within the temperate latitudes; but that of breeding would also seem an instinctive impulse of the creature, though its manner of breeding, whether it be viviparous, or oviparous, or whether it produce one or more in a season, is entirely unknown. It may however be inferred with a degree of plausibility, that its progeny are not very numerous, as is generally observed of the classes of larger animals; and this is a merciful arrangement of Providence, for did this monstrous reptile breed like herring or shad, not only the whole ocean, but the seas, and the rivers, would swarm with them, and they would devour every thing within their range. We should soon entirely lose our supplies of all the varieties of table fish, with which our bays and rivers so plentifully abound, and which constitute, not merely a nourishing, but even a luxuriant article of food, and in many countries an essential article of support to the inhabitants.

Whether there are different species, and varieties of the great Sea Serpent, or at what period of time it was first observed, it is equally impossible to determine. But we have notice of a great serpent, as early as the year 1746, which was seen by the honourable Laurence de Ferry, captain of the navy, extracted from the History of Norway, written by the Right Rev. Erich Pontoppidan, Bishop of Bergen, in the year 1751. This account states, that the head of this snake, which it held more than two feet above the surface of the water, resembled that of a horse; it had a grayish colour, the mouth quite black, and very large. It had black eyes; and a long white mane, that hung down from the neck to the surface of the water. That, besides the head and neck, were seen seven or eight folds, or coils, which were very thick, and as far as could be guessed, were about a fathom distance from each other. The same history observes, that this creature continually keeps itself at the bottom of the sea, except in the months of July and August, which is their spawning time; and, that then, they only come to the surface in calm weather, but plunge into the water again, as soon as the wind raises the least wave.

The documents furnished by the committee of the Linnæan Society, detail reports of other different periods, in which great serpents have been seen. One, which was immediately taken from the lips of the Rev. Mr. Abraham Cummings, June 28th, 1809; and which states, "that, in Penobscot bay has been occasionally seen, within these thirty years, a sea serpent supposed to be about sixty feet in length, and of the size of a sloop's mast." One is reported to have been seen in 1780; one in 1811; another was seen in June, 1815. Thus, it appears, from the documents, that the enormous reptile, which is the subject of our present inquiries, is not the first visitant of the kind on our coast; but that they have been seen at different periods, for a number of years past: and that their visits are for the purpose of breeding and feeding.

Much speculation, doubt, and conjecture have agitated the public mind concerning this extraordinary serpent. Its existence has been, and still is, doubted by many: but to such a volume of testimony as that, furnished by the committee of the Linnæan Society, the most obstinate incredulity must yield. It has been distinctly observed, a number of times, by persons of undoubted veracity: and in every instance, the circumstances attending its appearance, seem uniformly correspondent with those detailed in Bishop Pontoppidan's History. The weather was warm and calm, and the surface of the sea smooth. The times of his appearance also are in correspondence: he was seen at various times during the months of August and September; the earliest notice of the creature seems to be about the tenth of August, and he was seen the latter end of September. Its appearance was variously imagined and described by the different observers; but those variations of appearance might be owing to different degrees of distance, and different powers of vision. Its general appearance, however, was that of the serpent form. Its head was flat, and wider than the body at its juncture, gradually tapering off towards the mouth. The mouth wide; the tongue forked; the eye full, prominent, and piercing; the colour of the under jaw whitish; that of the body, and back part of the head, dark, inclining to black; the thickness of the body about the size of a flour barrel; and the length of the animal variously conjectured, from forty to a hundred feet. But, in order to afford the reader a better opportunity of arranging his conceptions of this extraordinary monster, we shall make free to quote a few of the observations verbatim.

Substance of the deposition of Amos Story, of Gloucester, Essex county, Massachusetts.

On the tenth day of August, A. D. 1817, I saw a strange marine animal, that I believe to be a serpent, at the northward and eastward of Tenpound Island, in the harbour of Gloucester. It was between the hours of twelve and one o'clock when I first saw him, and he continued in sight an hour and an half. I was sitting on shore, and was about twenty rods from him when he was nearest me. His head appeared shaped much like that of the sea turtle, and he carried his head ten or twelve inches above the surface of the water. His head at that distance appeared larger than the head of any dog I ever saw. He moved rapidly through the water: I saw no bunches on his back. On the twenty-third, saw what I believe the same animal again, at seven in the morning: he then lay perfectly still, and should judge that I saw fifty feet of him at least: neither his head nor tail was visible; his colour appeared to be a dark brown: and when the sun shone upon him the reflection was very bright. I thought his body was about the size of a man's body.

Deposition of Solomon Allen 3d, No. 4., in the county of Essex, ship-master.

I have seen a strange marine animal, that I believe to be a serpent, in the harbour of Gloucester. I should judge him to be between eighty and ninety feet in length, and about the size of a half barrel, apparently having joints from his head to his tail: my view about one hundred and fifty yards. When he moved on the surface of the water his motion was slow, at times playing about in circles, and sometimes moving nearly straight forward. When he disappeared, he sunk apparently down, and would next appear at two hundred yards from where he disappeared, in two minutes. His colour was a dark brown; did not discover any spots upon him. Saw him on the twelfth, thirteenth, and fourteenth, August. Was round him several times within one hundred and fifty yards of him. Saw him nearly all the day on the thirteenth, at from one hundred and fifty to three hundred yards distance from the shore. His motions appeared to be to the right and left. When I looked at him from the shore, at about two hundred yards distance, his mouth appeared to be open about ten inches. At times he would carry his head about two feet above the surface of the water, at others, just upon the surface. He turned quick and short about, and the first part of the turn resembled the link of a chain; but when his head came parallel with his tail, his head and tail appeared near together.

Here follow other depositions not materially differing from the preceding. But the deposition of Matthew Gaffney of Gloucester, we shall quote in substance; it proceeds as follows:

On the fourteenth of August, A. D. 1817, between the hours of four and five o'clock P. M., I saw a strange marine animal, resembling a serpent, in the harbour of Gloucester, I was in a boat and within thirty feet of him; his head appeared full as large as a four gallon keg, his body as large as a barrel, and his length, that I saw, I should judge forty feet at least. The top of his head was of a dark colour, the under part nearly white, as also several feet of his belly that I saw. I supposed and do believe that the whole of his belly was nearly white. I fired at him when he was nearest me. I had a good gun, and took good aim: I aimed at his head, and think I must have hit him: he turned towards us immediately after I had fired, and I thought he was coming at us; but he sunk down and went directly under our boat, and made his appearance at about one hundred yards from where he sunk: he did not turn down like a fish, but appeared to settle directly down like a rock. My gun carries eighteen to the pound; and I suppose there is no person in town more accustomed to shooting than I am. I have seen the same animal at several other times, but never had so good a view of him. His motion was vertical like that of the catterpillar.

Deposition of William B. Pearson, of Gloucester, merchant.

I have several times seen a strange marine animal, that I believe to be a serpent, of great size: I have had a good view of him only once, and this was on the eighteenth of August, A. D. 1817. I was in a small boat, and when off Webber's Cove (so called) in the harbour of Gloucester, I saw something coming out of the cove; we hove too, not doubting, but that it was the same creature that had been seen several times in the harbour, and had excited much interest among the inhabitants of Gloucester. James P. Collins was the only person with me. The serpent passed out under the stern of our boat, towards *Ten Pound Island;* then he stood in towards us again, and crossed our bow. We immediately exclaimed " here is the snake:" from what I saw of him, I should say that he was nothing short of seventy feet in length. I distinctly saw bunches on his back, and once he raised his head out of the water. The top of his head appeared flat, and was raised seven or eight inches above the surface of the water. He passed by the bow of the boat at about thirty yards distance: His colour was a dark brown. I saw him at this time about two minutes. His motion was vertical. His velocity at this time was not great; though, at times I have seen him move with great velocity; I should say at the rate of a mile in three minutes, and perhaps faster. His size I judged to be about the size of a half-barrel. I saw Mr. Gaffney fire at him about the distance of thirty yards: I thought he hit him, and afterwards he appeared more shy. He turned very short, and appeared as limber and active as the eel, when compared to his size. The form of the curve, when he turned in the water, resembled a staple. His head seemed to approach towards his body for some feet, then his head and tail appeared moving rapidly in opposite directions, and when his head and tail were on parallel lines, they appeared not more than two or three yards apart.

The last depositions we shall notice, are those of Sewell Toppan, master of the schooner Laura, and two others of said schooner, William Summerby, and Robert Bragg.

The deposition of Sewell Toppan proceeds thus:

On Thursday morning, August 28th, about 9 o'clock A. M., at about two, or two and a half miles east, of the eastern point of Cape Ann, being becalmed, I heard one of my men call to the man at helm, " What is this coming towards us?"—being engaged forward, I took no further notice till they called out again. I then got on top of the deck load, at which time I saw a singular kind of animal, or fish, which I had never before seen, passing by our quarter, at the distance of about forty feet, standing along shore. I saw a part of the animal, or fish, ten or fifteen feet, from the head downwards, including the head. The head appeared to be the size of a ten gallon keg, and six inches above the surface of the water. It was of a dark colour. I saw no tongue; but heard my men cry out, " look at his tongue." The motions of his head were sideways, and quite moderate: the motion of the body up and down. I have seen whales very often; his motion was much more rapid than that of a whale, or any other fish I have ever seen: he left a long wake behind him: he did not appear to alter his course in consequence of being so near the vessel. I saw him much less time than either of the others, and not in so favourable a position to notice his head. Judging from what I saw, out of the water, the body was about the size of a half barrel in circumference.

The deposition of Robert Bragg contains some other particulars. It observes, that, " he had a head like a serpent, rather larger than the body, and rather blunt: did not see his eyes; when about thirty feet astern of the vessel, he threw out his tongue about two feet in length; the end of it appeared to me to resemble a fisherman's harpoon; he raised his tongue several times, perpendicularly, or nearly so, and let it fall again. He was in sight about ten minutes. He moved at the rate of twelve or fourteen miles an hour. He was of a dark chocolate colour; and appeared two and a half feet in circumference; he made no noise; his back and body appeared smooth; a small bunch on each side of his head, just above his eyes; he did not at all appear disturbed by the vessel; his motion was much swifter than that of any whale, and I have seen many; his motion was very steady, a little up and down."

The deposition of William Somerby is, in substance, similar to the preceding. It observes, that, the creature threw out his tongue a number of times, about two feet from his jaws—the end of it resembled a harpoon: that he threw his tongue backwards several times over his head, and let it fall again. It proceeds thus, "I saw one of his eyes as he passed; it appeared very bright, and about the size of the eye of an ox."

We shall extract a few observations from the letter of Lonson Nash, Esq. (the gentleman before whom the preceding depositions were taken,) in reply to a communication from the committee of the Linnæan Society; giving a detailed account of his observations relative to the serpent. It was dated, Gloucester, September 9th, 1817. This gentleman says, "I saw him on the fourteenth ultimo, and when nearest, I judged him to be about two hundred and fifty yards from me; and at that distance I judged him to be (in the largest part) about the size of a half barrel, gradually tapering towards the two extremes. Twice I saw him with a glass, only for a short time, and at other times, with the naked eye, for nearly half an hour. His colour appeared nearly black. His motion was vertical. When he moved on the surface of the water, the track in his rear was visible for at least half a mile. His velocity I judged, when moving on the surface of the water, at about the rate of a mile in four minutes. When immersed in the water, his speed was greater, moving at the rate of a mile in two, or at most, three minutes. When moving under water, you could often trace him by the motion of the water on the surface, from which circumstance, I conclude he did not swim deep. He apparently went as straight through the water as you could draw a line. When he changed his course, it diminished his velocity but little. The two extremes that were visible, appeared rapidly moving in opposite directions, and when they came parallel, they appeared not more than a yard apart. With a glass I could not take in, at one view, the two extremes of the animal, that were visible; I have looked at a vessel, at about the same distance, and could distinctly see forty-five feet. If he should be taken, I have no doubt that his length will be found seventy feet, at least, and I should not be surprized, if he should be found one hundred feet long. When I saw him, I was standing on an eminence on the sea shore, elevated about thirty feet above the surface of the water, and the sea was smooth. I never saw more than seven or eight distinct portions of him above the water at any one time, and he appeared rough; though I supposed that appearance was produced by his motion. When he disappeared, he apparently sunk directly down like a rock.

Having thus presented our readers with a mass of evidence, which we consider as sufficient to establish the existence of this extraordinary animal beyond a doubt, and of the various observations and conjectures concerning it, we shall present them with the account of its scientific arrangement and character, as given by the committee of the Linnæan Society.

About four weeks after the foregoing depositions had been received, a serpent of remarkable appearance was brought from Gloucester to Boston, and exhibited as the progeny of the great Serpent. It had been killed upon the sea shore by some labouring people of Cape Ann. Capt. Beach jun. the possessor, very liberally submitted it to examination, and permitted an opening to to be made in the side for the inspection of its internal structure. The following appearances were the result of this examination.

*External appearance.*—The animal had the general form and external characters of a serpent; but was remarkably distinguished from all others of that class known to your Committee, by a row of protuberances along the back, apparently formed by undulations of the spine. From the back of the head to the first of these protuberances, was a distance of three inches and three fifths of an inch, during which the spine was straight. Between this place and the vent, its undulations were nearly regular, twenty four of these protuberences, about equally distant from each other, occupying the space between the neck and the vent. From the latter to the twenty fifth protuberance, the spine formed a straight line, of the length of one inch and nine tenths; its undulations there commenced again, and were continued quite to the exremity of the tail, forming sixteen more distinct protuberances. The size of these forty protuberances was proportioned to that of the body at the places, where they were respectively situated. The body could be bent with facility upward and downward a circumstance not common to other serpents. Those parts of the spine, which were straight, admitted much less motion in a vertical direction, than those, which were undulatory.

| | *ft.* | *in.* |
|---|---|---|
| The length of the head was | | $1\frac{3}{10}$ |
| From the back of the head to the vent | 2 | $2\frac{4}{5}$ |
| From the vent to the end of the tail | | $7\frac{2}{5}$ |
| Whole length | 2 | $11\frac{1}{2}$ |

The smallest circumference of the neck, one inch and a half. The circumference of the body over the largest protuberances $2\frac{4}{5}$ inches. The circumference of the body between the two largest protuberances $2\frac{9}{10}$ inches. The size of the body diminished suddenly at the vent, immediately beyond which the circumference of the tail was one inch and three fifths. The tail was round, and tapered very much, terminating in a point.

The head was rather larger than the neck, flattened; its anterior part pyramidal. rounded at the nose; the upper lip entire. The back part of the head was so much bruised, that its original form was not easily distinguishable. In the fragments of the upper jaw were seen three slender recurved teeth; in those of one side of the under jaw seven similar teeth, and the sockets of three others. No venomous fangs were found. The tongue was bifid, each fork being nearly half an inch long. The nostrils, situated between the second and third plate from the nose, were large, and oval. Between the nostril and the eye was a longitudinal hollow, bounded beneath by the upper lip, above by a very prominent superciliary ridge, extending beyond the eye. The eye was very large, nearly round, its breadth apparently a little diminished by the superciliary ridge, jutting over it. The whole head was covered with plates, but those on the top of it were so much broken, that their number and form could not be perfectly ascertained. The under jaw was divided by a longitudinal furrow, having triangular scutella at its anterior extremity, and two rows of scutellæ on each side.

The body was covered with hexagonal flat scales, those on the back narrowest; the throat with three or four rows of small scales; the belly with a hundred and eighty plates; the tail with ninety three pairs of scutellæ. Over the vent was one pair of scutellæ; at its sides four pair, the scales opposite to which were smaller than those on any other part of the body.

The colour of the head and of the upper part of the body and tail was an uniform deep brown; that of the belly and under part of the tail a bluish lead colour, lightest in the middle. The whole of the under jaw and throat were white, which colour extended in a clouded streak some way down under the neck, and fore part of the belly.

In the general disposition of its colours, in the number, form, and arrangement of the scuta and scutellæ, this animal approaches most nearly to the Coluber Constrictor; from which however it is strikingly distinguished by its undulating back, by its body being larger in proportion to its length, and diminishing more suddenly at the vent, the tail shorter, the teeth much larger and more distant, and the colour brown instead of black.

This animal is probably amphibious, although it has not the flat tail of the Pelamides; nor did the examination of its exterior enable us to discover any thing in its structure, peculiarly adapting it to a residence in the water, excepting only the remarkable facility of bending in a vertical direction. This motion, which may be observed in the leech, and various other aquatic animals, is quite as important as a horizontal one to an inhabitant of the ocean, and comparatively useless in an animal confined to the land.

*Internal Structure.*—The structure of the *spine* in this animal is very singular, and different from that of any serpent which we have seen, or known to be described. Its course throughout the greater part of the body is regularly undulating or flexuous, consisting of successive curves upward and downward. The structure of the different vertebræ varies to accommodate itself to this configuration, so that the spine cannot be extended into a straight line without dislocation of its parts. In the portion of spinal column which we examined, each curve consisted of about nine vertebræ. Each vertebræ was articulated by a round head on its posterior extremity to a socket in the anterior extremity of the next. It had five principal processes, one a spinous process; two anterior, and two posterior transverse processes. There were also smaller processes articulated with the ribs, and a sharp longitudinal prominence underneath. The spinous processes varied remarkably in shape and size, according to the part of the spine in which they were situated. Those occupying the top of the curve were very broad, and those of the bottom of the curve very narrow, the latter being not more than half the breadth of the former. The top of the spinous processes in the ascending or anterior half of each elevation of the back-bone projected considerably backward. In the descending half, on the contrary, they projected forward, so as to appear as if this part of the spine were inverted. The space between the spinous process was very great, amounting to nearly two thirds of their longitudinal diameter; a circumstance which contributes very much to the virtical flexibility of the spine, being much greater than it is in the Boa constrictor, one of the most flexible serpents, as represented by Sir Everand Home in his comparative anatomy; or than it is in the Coluber constrictor, which your committe have examined. The two anterior transverse processes are long and sharp, and are received under or pass within the two posterior transverse processes of the preceding vertebræ. They differ in direction according to the place which they occupy. Those in the highest vertebræ pass obliquely downwards, and those in the lowest, obliquely upwards. The posterior transverse processes also grow broader and less oblique as the vertebræ descend. The whole connexion and proportion of the processes is such, that the greatest downward flexion takes place at the top of the curve, and the greatest upward flexion at the bottom; an arrangement admirably adapted to increase the power of the muscles which act in the vertical flexion of the spine.

The ribs are articulated by a double cavity to a small double headed process under the anterior transverse process of each vertebra. They differ in length and direction, those at the bottom of the curve being shorter and more spreading than those at the top, so that the lower extremities of the whole fall in a right line.

*Muscles.*—The principal muscles on the outside of the trunk consist of three strong dorsal muscles with oblique fibres continually arising from the vertebral processes, or ribs, and inserted by an aponeurosis into other bones of a similar kind. Below, there is a broad thin lateral muscle or congeries of muscles, connected to the ribs only. These muscles according to their situation act in performing the various inflexions of the body.

On the inside of the ribs a series of their muscles was observed, arising from the bodies of the vertebræ, passing obliquely downwards and forward under the ribs and over the fourth, and afterwards inserted into ribs beyond. These muscles in conjunction with others, according to

Sir Everand Home and other authors, act upon the ribs in serpents to assist their progressive motion on land.

*Viscera.*—The only part of the viscera, which the limited openings permitted us to examine, were a portion of the lung and œsophagus, with the mesentery and blood vessels, also a small part of the stomach. The lung was a long cellular and tubular viscus, as in other serpents, but with this remarkable peculiarity. It was successively dilated and contracted so as to adapt itself to the cavities formed by the undulations of the spine. The œsophagus was also unequal, but without relation to the cavities of the spine, not being in contact with it. In the stomach was found a mass of scales, also the tail and part of the skin of a serpent of a different species, having all the scales carinate.

In regard to the use or final cause of the curvatures in the back-bone, which give so peculiar a character to this animal; it is obvious that two important ends are effected by it. These are an increase of *flexibility* and an increase of *strength* in *vertical motions*.

1. The flexibility is increased, because in any given length of body, there will be more joints in a crooked, than there would be in a straight spine, composed of vertebræ of the same dimensions.

2. The strength in vertical motions is increased, since the fulcrum formed by the highest articulation is more remote from the power applied by the lateral muscles, and the fulcrum formed by the lowest articulation is also more remote from the power applied by the dorsal muscles, than they would be if the spine pursued a straight and intermediate course.

The dorsal muscles, however, being bound down by an aponeurosis, so as to pursue nearly the course of the spine, are nearer their fulcrum and have less of this advantage than the lateral muscles, which are farther from their fulcrum; so that the greatest power is probably that which is exerted in the forward flexion or extension of the body. This power is the one which would be most useful to the animal in swimming at the surface of the water with a motion in any degree vertical.

• Your committee considering this serpent as nondescript, and as distinct from other genera of serpents in the flexuous structure of its spine, have deemed it necessary to constitute a new genus, founded on this peculiarity. They have adopted the descriptive name *Scoliophis*, and have added the local specific name of *Atlanticus*.—Compared with the genera of Linnæus and Lacepede its character will stand thus:

Scoliophis.—*Scuta on the belly*, *scutellæ on the tail, spine flexuous.*

*Atlanticus.* Scoliophis.

*Extract of a letter from Lonson Nash, Esq. to the Hon. John Davis, Boston.*

"Dear Sir—That I might be enabled to communicate the circumstances attending the capture of the young serpent more minutely, on Friday last I went to view the place where he was taken, accompanied by Mr. Coleby. He pointed out the spot, where he was first seen by his son, and the place where killed. My statement to you, on the 28th ultimo, relative to the *distance* from the sea, where the young serpent was killed, was not correct. I was informed, by Capt. Beach, that he was within twelve or fourteen feet of the sea, when killed; but I paced the ground, and found the distance, from high water mark, one hundred and fifty paces. He lay extended by some whortleberry bushes, when first discovered. The boy called to his father(who was at four or five rods distance) to run, for he had never seen so strange a snake. Mr. Colbey ran, with a pitch-fork in his hand, and with his fork, confined the serpent against some loose rocks; when the serpent exhibited the most violent temper. twice he bit himself, held on, and shook, (to use Mr. Colbey's expression,) as one dog shakes another, when fighting. His tail seemed likewise a weapon of defence; for he struck the end of it against the fork handle several times. His motion was vertical; his progress was not near so fast as a man ordinarily walks. His progressive motion was produced, by first contracting, and then extending himself. When contracted, Mr. Colbey says, he was not more than one foot and half in length, and then the protuberances on his back were, at least, three times as large, as when extended. The young serpent was killed in a meadow, near Loblolly cove. Loblolly cove lies upon the eastern shore of Cape Ann, about west from Thatcher's island. This cove makes up about one hundred and fifty yards into the main land, in a southwesterly direction. This cove is not much frequented; the nearest dwelling houses are distant from the cove, from one fourth, to half a mile."

A few remarks on the question, whether the great serpent, seen in the harbour of Gloucester, be the Scoliophis Atlanticus, will close our report.

The appearance at nearly the same time and place of two creatures, agreeing with each other in certain important and conspicuous particulars, disagreeing in the most remarkable of these particulars with other animals of their class; and between whom no difference, but that of size, has been discovered, must naturally lead to a conjecture that they are of the same species. The evidences in favour of this supposition are so considerable, that your committee would not be justified in neglecting to direct your attention to them.

The principal circumstances which encourage the idea that these animals possess the same structure and configuration, are the following.

The appearances noticed in the depositions, relative to the great serpent, except in the few instances of contradiction, all of them agree with, and are accounted for, by a structure like that of the Scoliophis. The protuberances seen above water might be produced in two ways. By bunches on the back projecting out of the water, while the animal was at rest, or by vertical undulations of the body when in motion. The supposition that both these appearances have been presented at different times, is the most satisfactory mode of accounting for the variety of testimony with regard to the *number*, *size*, and *distance* of these protuberances. The other facts stated in relation to the form and general arrangement of colours in the large serpent, apply sufficiently well to the Scoliophis. The shape of the head and proportion of the eye—the protuberance on the side of the head, just above the eye—the form of the mouth—the distance from the head to the commencement of the protuberances—the brown colour of the body, and the whitish colour of the under part of the head and neck—the disappearance of bunches from what was supposed to be the navel *towards* the tail—the tapering of the body toward the tail—its roundness, and great flexibility, are all points of the closest resemblance. These coincidences cannot be the effect of design, since all the depositions from Gloucester, relative to the great Serpent, were in the hands of your Committee before the Scoliophis was discovered.

Some other circumstances stated by the deponents, though not applying to the smaller serpent, are nevertheless easy to be accounted for. The prong or spear seen near the head of the animal when in motion, was probably the tongue. The shape of a harpoon ascribed to that organ was doubtless an optical illusion, occasioned by its rapid vibration; and this, it is well known, is not the first instance of such a deception.

The structure of the Scoliophis is well suited to a residence in the water, being capable of various and complicated motions. It bends horizontally, as did the great Serpent in the act of turning; it bends vertically, as that animal was supposed to do, in the act of swimming; and it might assume any compound and intermediate motion, which should be most effectual in propelling it through the water.

It is worthy of remark, that nearly all the circumstances with regard to the appearance of the great Serpent, stated by the deponents, as facts, agree with the structure of the Scoliophis. On the other hand, those stated as conjectures, such as these; that the belly was white, that the animal had a navel, and no bunches beyond that quite to the end of the tail, &c. almost uniformly disagree with it. This is what might naturally be expected from honest men testifying in regard to an object, with which they were but partially acquainted.

Supposing that the species of the two serpents is the same, it is not improbable that one is the progeny of the other. The Collubri without fangs, the tribe most nearly resembling the Scoliophis, are said by naturalists to be generally if not always oviparous, to deposit their eggs in the sand in the spring or the end of summer, and to abandon them. The eggs are hatched by the heat of the sun often in less time than a month. It will be remarked that the large serpents described in our accounts and depositions, were seen near the shore, and only in the month of August, excepting once at Plymouth in June.

The principal objections against the specific identity of these two animals are derived from the following circumstances.

1 Their disproportionate size. This however is not apparently greater than is found between the young and the full grown individuals of some other animals. The Boa constrictor may be mentioned as an instance.

2 The one was seen only in the water and the other on land. This objection is lessened when we recollect that the eggs of amphibious animals are deposited on land. The large serpent may have visited the shore in the night or at other times. That it was an amphibious animal, dependent on respiration, is rendered probable by its general structure, and by its frequenting the surface of the water, often with its head elevated above it. The small serpent was fonnd near the salt water, in a place, over which the sea breaks in stormy weather. Supposing it a young animal, it might have remained in the place where it was hatched, or it might occasionally have resorted to the shore from the water. We should not expect it to venture far from the shore, until its increased size should afford it some security from becoming a prey to larger animals of the ocean.

The circumstance that no evidences of immaturity were observed in the Scoliophis might be considered as the source of a third objection, if it were not well known, that as serpents generally abandon their eggs, their young are perfect in all their parts, and capable of providing for their own subsistence immediately on being hatched.

On the whole, as these two animals agree in so many conspicuous, important and peculiar characters, and as no material difference between them has yet been clearly pointed out, excepting that of size; the Society will probably feel justified in considering them individuals of the same species, and entitled to the same name, until a more close examination of the great Serpent shall have disclosed some difference of structure, important enough to constitute a specific distinction.

JOHN DAVIS,
JACOB BIGELOW,
*Boston*, 11*th Oct.* 1817. FRANCIS C. GRAY.

Ratte Snake. (Pl. 52.) The colour of the rattle-snake, which is bred both in North and South America, but in no part of the old world; is yellowish brown above, marked with broad transverse bars of black. Both the jaws are furnished with small sharp teeth, and the upper one has four large curvated and pointed fangs. At the base of each is a round orifice, opening in a hollow that appears again near the end of the tooth in the form of a small channel; these teeth may be raised or compressed. When the animals are in the act of biting, they force out of a gland near the roots of the teeth, the fatal juice. This is received into the round orifice of the teeth, conveyed through the tube into the channel, and from thence with unerring direction into the wound. The tail is furnished with a rattle, consisting of joints loosely connected; the number of these is uncertain, depending in some measure on the age of the animal, being supposed to increase annually by an additional joint. The young snakes or those of a year or two old, have no rattle at all.

As the tail of those snakes, which are the most dreaded of all serpents, keep rattling upon the slighest motion, passengers are thus providentially wained of their approach. In fine weather the notice is always given, but not always in rainy weather; this inspires the Indians with a dread of travelling among the woods in wet seasons. In addition to this circumstance, the odour of the rattle snake is so extremely fœtid, that when it basks in the sun, or is irritated, it is often discovered by the scent before it is either seen or heard. Horses and cattle frequently discover it by the scent, and escape at a distance; but when the serpent happens to be to leeward of their course, they sometimes encounter its venom.

Rattle-snakes are viviparous, producing their young generally about twelve in number, in the month of June, and by September these acquire the length of twelve inches. It has been well attested that they adopt the same mode of preserving their young from danger as that attributed to the common viper, receiving them into the mouth and swallowing them.

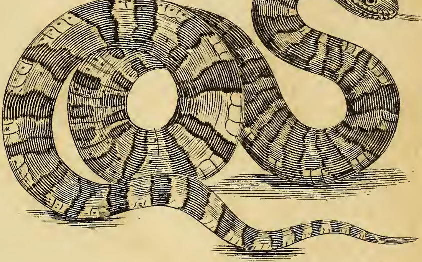
Boa. (Pl. 52.) The ground colour of the body of this animal, which is the largest and strongest of the serpent race, is yellowish-gray, on which is distributed, along the back, a series of large chain-like, reddish brown, and sometimes perfectly red variations, with other small and more irregular marks and spots. They are regularly distinguished from other serpents in the under surface of the tail, being covered with undivided plates like those on their belly; and their body not being terminated by a rattle. There are three species, natives of Africa, India, the larger Indian islands, and South America, where they chiefly reside in the most retired situations in woods and marshy retreats.

The great boa is frequently from thirty to forty feet in length, and of a proportionate thickness. But happily for mankind, the rapacity of these creatures is often their own destruction: for whenever they seize and swallow their prey, they seem like surfeited gluttons, unwieldy, stupid, helpless, and sleepy. They at the same time seek for some retreat, where they may lurk for several days together, and digest their meals in safety. The smallest effort will then destroy them: they scarcely can make any resistance; and, equally unqualified for flight

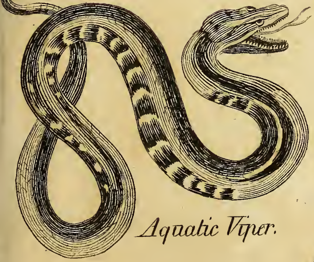
Pl. 52.

*Rattle Snake.*

*Boa.*



*Anulated Snake.*



*Aquatic Viper.*

*Egyptian Viper.*

or opposition, even the naked Indians do not fear to assail them. But it is otherwise when this sleeping interval of digestion is over: they then issue, with famished appetites from their retreats, and with accumulated terrors, while every animal of the forest flies from their presence. They never bite, however, from any other impulse than that of hunger, and when they do, their bites are destitute of venom.

Common English Snake. The ringed or black snake, which is the most common, and largest of the English serpents, sometimes exceed four feet in length. The neck is slender; the middle of the body thick; the back and sides covered with small scales; the belly with oblong, narrow, transverse plates; the colour of the back marked with two rows of small black spots, running from the head to the tail; the plates on the belly are dusky; the scales on the sides are of a bluish white; the teeth are small and serrated, lying on each side of the jaw, in two rows. The whole species is perfectly inoffensive, taking shelter in dunghills, and among bushes in moist places, whence they seldom remove, unless in the midst of the day, in summer, when they are called out by the heat to bask themselves in the sun. If attacked, they first endeavour to escape, but if much pressed, they begin to hiss, and put themselves in a threatening position, though incapable of doing mischief.

These snakes in winter conceal themselves, and become nearly torpid, re-appearing in spring, when they uniformly cast their skins. This is a process that they also seem to undergo in the autumn.

The female deposits her eggs in holes fronting the south, near stagnant waters; but more frequently in dunghills, in the form of a continued chain of ova, to the number of from twelve to twenty: these are about the size of the eggs of a blackbird, of a whitish colour, and covered with a parchment like membrane. The young ones are rolled up spirally within the middle of the fluid, which greatly resembles the white of a fowl's egg.

They are not hatched till the spring following, the time, when they are laid.

ANNULATED SNAKE. (Pl. 52.) The ground of the snake is white, with brown transverse bars, which are straight and distinct on the back, but run into one another on the belly. The tail is slender, and has two ranges of imbricated scales on its under surface. This animal is a native of South America, and when irritated or preparing to bite, raises up the fore part of its body, and carries its head in a bending position.

Of this species there are a great number of elegant varieties, many of which are figured in the elaborate work of Seba, particularly the large annulated snake of Surinam.

AQUATIC VIPER. (Pl. 52.) This species is a native of India, frequenting wet swampy fields, and commonly reckoned a water snake: its length is about two feet nine inches; circumference, three inches and a half: head rather broad, somewhat depressed, and laterally compressed; its body is covered with large scales, gradually diminishing towards the tail, which is eleven inches in length, slightly carinated, tapering very gradually, and terminating sharply. Head dusky; rest of the animal yellowish brown, with numerous round black spots, joined by narrow fillets regularly disposed in oblique rows, a few scales of light yellow being interspersed: abdomen, yellowish white.

One of these vipers was caught in the lake of Ankapilly, in one of the traps employed for catching eels, and by several experiments made with a stick in trying to provoke it, it did not either hiss or snap; neither was it provoked to bite a chicken, though pecked several times by the animal: while it lay coiled up, a chicken properly secured, was laid upon it, but it continued quiet, without attempting to wreath round the chicken, or otherwise to annoy it; and when the bird fluttered and struggled to get loose, the snake, as if afraid, crept away. It should be remarked, however, that in the course of this last experiment, the viper threw up a large fish, which appeared to have been but a short time in the stomach; so that its forbearance might, in some measure, be owing to not being hungry; a circumstance that suggested caution against hasty decision. But it certainly is not venomous, and does not appear to be very irrascible. It is regarded by the natives as harmless.

EGYPTIAN VIPER. (Pl. 52.) This is said to be the officinal viper of the Egyptians, and is by some supposed to be the asp of Cleopatra, by the bite of which that high-spirited princess determined to die, rather than submit to be carried to Rome in order to grace the triumph of Augustus. It is imported in considerable quantities every year to Venice, for the use of the apothecaries in the composition of treacle, and for other purposes, particularly as an incitement to libidinous desires. It is abundant in Egypt; and is found in other parts of Africa as well as in Asia. It is from twenty inches long, to three feet and upwards, variegated with rich chesnut brown spots or bands, on a lighter brown ground, the scales remarkably short, close set, and hard; the eyes are vertical; the head compressed, and covered with very minute dark brown scales, and reddish stripes. It is very poisonous, but not often fatally so.

The variegated viper, is so named from the mixture of colours on its body, which is mottled with white, brown, and gray; the sides and belly are pale yellow; and its form and size is much the same as the preceding. It is a native of America, but not poisonous.

INTESTINE VIPER. So named from its lurking in secret and hidden places for its prey. It is a small species, inoffensive to man, and devoid of poison. Its prey is insects, lizards, frogs, toads, and mice. The ground colour of its body is a reddish brown, mottled and variegated with white transvere bands, and narrow longitudinal lines on the back and sides. It is a native of Africa, and found plentifully on the coast of Guinea.

HORNED VIPER. (Pl. 53.) The cerastes or horned viper, which commonly grows to the length of about a foot or fifteen inches, but sometimes more than two feet, is distinguished by a pair of horns or curved processes, situated above the eyes, and pointing forward: these horns have nothing analogous in their structure to the horns of quadrupeds, and are by no means to be considered in the light of either offensive or defensive weapons; they are moveable, and about one sixth of an inch long.

The head of the cerastes is flattened; the muzzle thick and short; the eye yellowish green. The hind part of the head is narrower than the part of the body to which it is attached. The scales of the head are of the same size with those on the back, or only a little less; and all the scales are oval with a longitudinal ridge. The general colour of the back is yellowish, with irregular spots of different degrees of darkness, in form of transverse bands. The under surface of the body is brighter. The cerastes inhabits the greatest part of the eastern continent, especially the desert sandy part of it. It abounds in the three Arabias, and in Africa.

This animal can endure hunger and thirst much longer than most serpents; some naturalists assert that it can exist five years without nourishment. But, though able to live long without food, these animals are extremely voracious, and attack small birds, quadrupeds, and reptiles with great eagerness. Their skin is capable of very great extension, and they can swallow food till increased to twice their ordinary size; and, as their digestion is extremely slow, they become, when gorged, quite torpid and motionless, in which situation they are very easily killed.

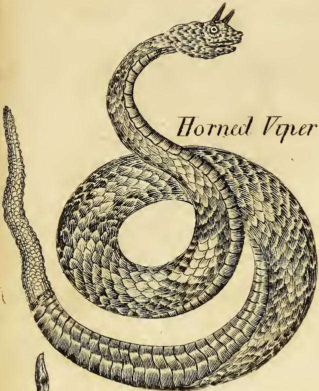
LIFE-CONSUMING VIPER. (Pl. 53.) This venemous serpent well deserves the above name; and is most deservedly dedicated to one of the fates, on account of the violent poison which distils from its murderous fangs. It is a native of the burning zone of Africa, and of the warm regions of South America; it is also found in the island of Ceylon, and in the remote provinces of Asia. The ground colour is a silvery white, variegated with black irregular spots and blotches. The head is broad, and the mouth large and blunt; the eyes like drops of pearl, surrounded with a green iris; the head cordated with quadruple rows of transverse white beads, like lines, passing behind the eyes, on a black ground; the scales are varied, some large and shield-formed, others small and pointed; all remarkably strong and close set. This is a most dangerous and formidable serpent, whose poison, though not so rapid in its effects as some, yet causes a stupefaction of the mental faculties, a wasting of the flesh by incurable consumption, and finally death.

COMMON EUROPEAN VIPER. (Pl. 53.) The common viper is found in most countries of the ancient world. In the East Indies also it is to be met with, with only very slight variations from the individuals of Europe. It is even able to support the vicissitudes of very cold climates, being found in Sweden, where its bite is nearly as dangerous as in the warmer regions of Europe. It is likewise found in Russia, and in several parts of Siberia, where it is very numerous, as the superstitions of the people deter them from endeavouring to destroy this noxious reptile, because they conceive some terrible disaster will follow the attempt.

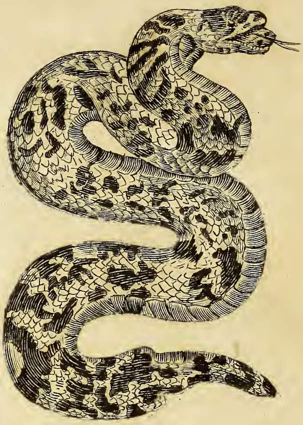
Vipers crawl slowly at all times, and in general only attack such smaller animals as are their usual food.—They never willingly attack man or the larger animals, except when wounded, trampled on, or irritated, when they become furious, and are apt to bite severely. From the firmer manner in which their spine is articulated, they are unable to turn or twist themselves so much as most other serpents, being only able to turn the head with any considerable degree of agility; owing to this circumstance, they are easily taken. For this purpose, some persons use a forked stick, to fix the viper by the neck; and then, seizing it by the tail, throw it into a bag.—Others, holding down its head with the end of a stick, take it fast in the left hand by the neck; and, while the animal makes ineffectual efforts to defend itself, with its mouth wide open, cut out its poisonous fangs with a pair of scissors or a knife: the viper, after this, is incapable of doing injury, and may be handled with perfect safety. The English viper-catchers have the boldness to seize them suddenly by the neck, or even by the tail, with their hands; and, holding them with a firm grasp, the animal is altogether incapable of turning itself sufficiently to bite the hand that holds it fast.

The length of the common viper seldom exceeds two feet, though sometimes they are found above three. The ground colour of their bellies is of a dirty yellow; that of the female is deeper. The back is marked the whole length with a series of rhomboid black spots, touching each other at the point; the belly is entirely black. It is chiefly distinguished from the common ringed snake by the colour, which in the latter is more beautifully mottled, as well as by the head, which is thicker than the body; but particularly by the tail, which in the viper, though it end in a point, does not run tapering to so great a length as in the other: when, therefore, other distinctions fail, the difference of the tail can be discerned at a single glance. These animals are found in many parts of Europe, particularly in the dry, stony, and chalky countries. It is extremely difficult to kill this animal. It will exist for three or four hours, or longer, in spirits of wine: yet, tobacco, and especially its essential oil, proves speedily fatal to them.

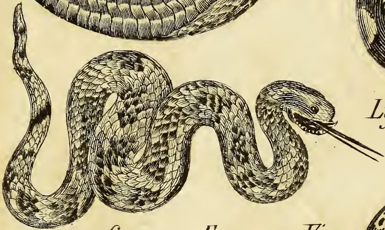
FATAL VIPER. (Pl. 53.) The head of this animal is short and round; the mouth large and wide, armed with four curvated teeth, two in each jaw; the eyes darting fire; and its bite inflicting cruel and inevitable death. It has also the faculty of erecting its scales at pleasure, or when irritated, and of closing them again with a rattling noise. A border of silver-white scales surrounds the mouth; the tongue is fleshy and forked, which the creature can protrude to a great length when offended; at which time it also shews its teeth in a menacing posture, like a snarling dog, and thus it can shew or conceal its fangs at pleasure. The scales on the upper part of the body are elegantly speckled with pale yellow, cinerous gray, black, brown and white; glistening most superbly in the sun. It is found in South America, and in the island of Ceylon; it will attack man or beast with great fury, erecting its crest and darting forward with singular rapidity and courage. The male is deeper coloured



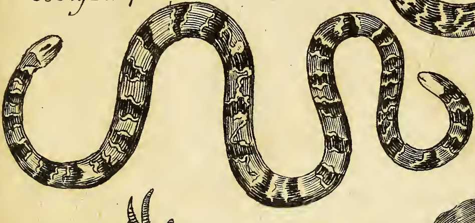
Horned Viper



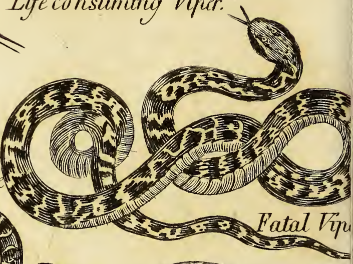
Life consuming Viper.



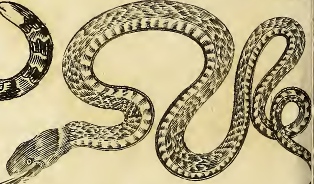
Common European Viper.



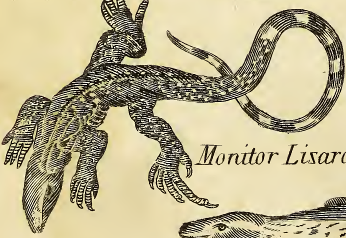
Sooty Amphisbaena or blind Snake



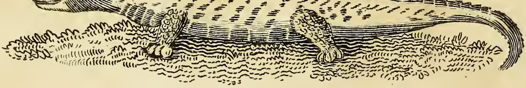
Fatal Vip



Egyptian Asp.



Monitor Lisard.



Warty Lizard.

than the female, and seems to have a larger body and a more slender tail. The general length of this snake seems to be about four or five feet, and the tail long in proportion to the body.

Sooty Amphisbæna, or Blind Snake. (Pl. 53.) This species grows usually to the length of one or two feet, of which the tail never exceeds an inch, or an inch and a quarter. The eyes are exceedingly small, and covered in such a manner by a membrane, as to be hardly perceptible; from which circumstance, it has been called the blind serpent. The top of the head is covered by six large scales, in three rows of two each; and the body is entirely covered with smooth scales of an almost square form, arranged with regular transverse rings.

This animal is found in India, particularly in the isle of Ceylon; and likewise in America. Its habits are in a great measure unknown; but it feeds on earth-worms, beetles, and various insects; it is particularly fond of devouring ants; which in numberless legions often destroy all before them, leaving every thing desolate, as if destroyed by fire. Having the power of advancing or withdrawing itself without injury, in consequence of its structure, this serpent is peculiarly fitted for penetrating into the subterraneous retreats of ants, worms, and other insects; and is able to dig deeper than any other serpent, its skin being very hard, and its muscles very strong.

Egyptian Asp. (Pl. 53.) This animal is about three feet in length; the head is rather large, and covered with small carinated scales, the body with larger, of similar structure; the colour is pale rufous gray, and along the upper parts are three longitudinal ranges of deep rufous spots, bordered with black, and which unite or become confluent towards the tail, in such a manner as to exhibit the appearance of a zigzag band, resembling in some degree that of the common viper: the under parts are of a dusky colour, marbled with dull yellow: in the structure of its fangs it resembles the viper, and is said to be equally poisonous. The nose is terminated by an erect wart-like excrescence.

This creature preys by smell, and feeds on rats, mice;

lizards, frogs, toads, &c.—Its bite is cured by volatile alkaline spirit, particularly that preparation called eau-deluce; and even by fetid spirit of tartar.

GREEN LIZARD. The colouring of this species is seen in its greatest brilliancy about the beginning of spring; when, after having thrown off its old covering, it exposes its new skin, with all its bright enamelled scales, to the genial warmth of the sun's rays, which, playing on the scales, gild them with undulating reflections. The upper parts of the body are of a beautiful green, more or less variegated with yellow, gray, brown, and even sometimes with red; the under parts being always more of a whitish colour. The colours of this species are subject to variety, becoming pale at certain seasons of the year, and more particularly after the death of the animal. It is chiefly in the warm countries that it shines with all its superb ornaments, like gold and precious stones. In these regions it grows to a larger size than in more temperate countries, being sometimes found thirty inches in length.—The inhabitants of Africa eat the flesh of this animal.

The green lizard is by no means confined to the warmest countries of both continents; it is found likewise in temperate regions, though it is there smaller and less numerous. It is not even known in Sweden, and in Kamtschatka; and in both countries, in spite of its beautiful appearance, it is looked on by the inhabitants with horror, from some strange superstitious prejudices.

WARTY LIZARD. (Pl. 53.) This animal is six or seven inches in length, and entirely covered, except on the belly, with small warts. The under parts are of a bright yellow colour, and the upper mostly of a black brown, spotted with black. It is very common in this country, where it resides altogether either in the water, or in very damp places, and its tail being flattened perpendicularly, it uses it as a rudder in swimming. It is usually seen crawling along the bottom, but it now and then rises, with a wriggling motion, to the surface.

Being never seen in winter, these lizards are supposed to retire into holes or mud, and become torpid. They deposit their spawn towards the end of May or beginning of June, in small clusters, consisting of several palish yellow brown globules included in surrounding gluten. While young they are furnished with fins on each side of the breast, which fall off when the animals attain a perfect state.

These animals, like many other reptiles, change their skins at certain periods. Which opperation is generally performed at the end of every fortnight or three weeks.

MONITOR LIZARD. (Pl. 53.) The monitor, or monitory lizard, is one of the most beautiful of the whole tribe, and is also one of the largest; sometimes measuring not less than four or five feet from the nose to the tip of the tail. Its shape is slender and elegant, the head being small, the snout gradually tapering, the limbs moderately slender, the tail laterally compressed, and insensibly decreasing towards the tip, which is very slender and sharp. Though the colours of this lizard are simple, yet such is their disposition, that it is impossible to survey their general effect without admiration. In this respect, however, the animal varies, perhaps, more than most others of its tribe; hence the many varieties quoted, which chiefly consist in the distribution of the colours. However, it is most commonly black, with the abdomen white; the latter colour extending to some distance up the sides, in the form of several pointed bands, besides which the whole body is generally ornamented by several transverse bands consisting of white annular spots, while the head is marked with various streaks of the same colour, the limbs with very numerous round spots, and the tail with broad transverse bands. In others the spots forming the lateral bands are simple instead of annular; and in others the annulio or white rings are themselves composed of small white spots, which are likewise often scattered here and there over the black ground colour: which in some, instead of being black, is of a deep brown. —All, however, agree so far in the general disposition of the variegations, that it is not easy to mistake the species for any other.

This elegant animal is a native of South America, where it frequents woody and watery places, and, if credit may be given to the reports of some authors, is of a disposition as gentle as its appearance is beautiful. It has even gained the title of monitor, from its pretended attachment to the human race, and it has been said that it warns mankind of the approach of the alligator by a loud and shrill whistle.

Toad. This animal, which is easily recognized by its livid appearance and sluggish and disgusting movements, is, in figure, nature, and appetites, like the frog. In Europe it is of a considerable size, the smallest individuals measuring from four to six inches in length. Its eyes are remarkably beautiful, having a brilliant reddish gold-coloured iris surrounding the dark pupil, and forming a striking contrast with the remainder of its body.

These animals are so extremely numerous in Carthagena and Porto Bello in America, that in rainy weather, not only all the marshy grounds, but the gardens, courts, and streets are almost covered with them; so much so, that many of the inhabitants believe that every drop of rain is coverted into a toad. If it happens to rain during the night, all the toads quit their hiding places, and then crawl about in such numbers, as almost literally to touch each other, and hide the surface of the earth; on such occasions it is impossible to stir out of doors without trampling them under foot at every step.

When irritated, this creature emits from various parts of its skin a kind of frothy fluid that, in our climate, produces no further unpleasant symptoms than slight inflammation, from its weakly acrimonious nature. It is persecuted and murdered wherever it appears, on the supposition merely that because it is ugly it must in consequence be venomous; and its reputation as a poisonous animal obtained for it among the superstitious so many preternatural powers, that the reputed dealers in magic art are reported to have made use of it in their compounds.

The female toads deposit their spawn early in the spring, in the form of necklace-like chains or strings of beautifully transparent gluten, three or four feet in length, inclosing the ova in a double series throughout. These have the appearance of so many jet black globules; they are, however, nothing more than the larvæ, or tadpoles, lying in a globular form. These break from their confinement in about a fortnight, and afterwards undergo changes very similar to the tadpoles of the frog. They become complete about the beginning of autumn, when the young animals are frequently to be seen in immense multitudes.

Frog. (Pl. 54.) The common frog is known throughout Europe, being almost every where seen in moist situations, or wherever it can command a sufficient quantity of insects, worms, &c. on which it feeds. In colour it varies considerably, but its general tinge is olive-brown variegated on the upper parts of the body and limbs with irregular blackish spots; those on the limbs being mostly disposed in a transverse direction: beneath each eye is a longish mark or patch, reaching to the setting on of the fore legs, and which seems to form one of its principal distinctions.

It is generally in the month of March that the frog deposits its ova or spawn, consisting of a large heap or clustered mass of gelatinous transparent eggs, in each of which is imbedded the embryo, or tadpole, in the form of a round black globule. The spawn commonly lies more than a month, or sometimes five weeks, before the young, or tadpoles, are hatched from it; but during this period, each egg gradually enlarges in size, and a few days before the time of exclusion, the young animals may be perceived to move about in the surrounding gluten.

The form of the frog is light and elegant, and its appearance lively; the limbs finely calculated for the peculiar motions of the animal, and the hind feet strongly webbed, to assist its progress in the water, to which it occasionally retires during the frosts of winter, when it lies in a state of torpidity, either deeply plunged in the soft mud at the bottom of stagnant waters, or in the hollows beneath their banks, till it is awakened from its slumber by the return of spring.

Chameleon. (Pl. 54.) Chameleons are found in various sizes, but are seldom above fourteen inches long, of which the tail is seven; and the length of the legs, including the toes, is about three inches. It is found in all the warm countries, both of the old and new worlds, in Mexico, in Africa, at the Cape of Good Hope, in Ceylon, Amboyna, &c. The whole skin of the chameleon is strewed over with little knobs, like shagreen; these are extremely smooth, and more remarkable on the head, (which is particularly flat on the top and both sides) and are surrounded with minute, and almost imperceptible grains. The nostrils are placed at the tip of the muzzle, which is somewhat rounded. The mouth is wide and the bones of the jaws denticulated, so as to represent small teeth. The tongue is of a very extraordinary form; being composed of white solid flesh, about ten inches long, and three broad, round, a little flattish towards the end, hollow, and open, somewhat like the end of an elephant's trunk. And with this instrument it seizes insects, on which it subsists, with wonderful quickness.

Whether climbing slowly along the branches of trees, or concealing itself below the leaves in expectation of insects, or walking deliberately on the ground, the chameleon is always extremely ugly in its appearance, having neither agreeable proportions, nor beauty of form, nor elegant movements, to please the eye of the observer, so that no one can attempt to catch, or even to touch it, without disgust. Of the changes of colour we must now speak more particularly.

When at rest and in the shade for some time, the grains or little eminences on the skin are sometimes pale red, and the soles of the feet are white, slightly tinged with yellow. This colour changes, when exposed to the light of the sun: that part of the skin on which the rays of the sun fall, is frequently of a brownish gray, while the unilluminated part is of a beautiful fawn colour, produced by the mixture of pale yellow, which the granular eminences assume, joined with a clear red, that then appears on the plain skin between the grains. This splendid colouring is usually distributed in blotches, between which the grains appear mixed with blue and greenish, and the flat skin is reddish. At other times the whole skin seems of a beautiful green, spotted with yellow. When touched, it often becomes suddenly spotted all over with pretty large blackish blotches, mixed with some green; but it is now thoroughly ascertained, that it by no means assumes the colours of the bodies which are around it; that those which it accidentally presents are not extended over the whole of its body, as was formerly believed.

# OF INSECTS.

AS insects possess the various powers of creeping, flying, and swimming, there is scarce any place, however remote and secure, in which they are not to be found: and therefore, upon casting a slight view over the whole insect tribe, just when they are supposed to rouse from their state of annual torpidity, when they begin to feel the genial influence of spring, and again exhibit new life in every part of nature, their numbers and their varieties seem to exceed all powers of calculation, and they are certainly too great for description; but from the similitudes of the form, manners, and propagation of several of them, the extensive description has been easily compressed, and has rendered a separate history for each species totally unnecessary.

BEETLE. (*Scarabæus. Stag and Golden Beetle.* Pl. 54.) All animals of the beetle kind have their bones placed externally, and their muscles within, like shell fish. These muscles are like those of quadrupeds, and are formed with surprising strength, so that bulk for bulk, they are one thousand times stronger than those of man. This strength is of use in digging the animal's subterraneous abode, whither it most frequently returns, even after it becomes a winged insect capable of flying. Besides the difference which results from the shape and colour of these animals, the size also makes a considerable one, some beetles being not larger than the head of a pin, while others, such as the species called the elephant beetle, are as big as one's fist. But the greatest difference among them is in the time of their production; some being producd in a month, and which, in a single season, pass through all the stages of their existence, as the golden beetle; while others take near four years in their production, and live as winged insects one year more, as the stag beetle.

Naturalists enumerate eighty-seven species of this genus. They all concur, however, in one common formation. The antennæ are of a clavated figure, and fissile longitudinally; the legs are frequently dentated; they have cases to their wings, which is a provision admirably adapted to their mode of existence. Though these cases do not assist in flight, yet they defend the internal wings from injury, and make a loud buzzing noise when the animal rises in the air.

GIGANTIC COCKROACH. (Pl. 55.) This insect is the largest of its species, and near the size of a hen's egg. It is a native and plague of the warm parts of Asia, Africa, and South America. This, and indeed all the other species of cockroaches, are a race of pestiferous beings, equally noisome and mischievous to natives or strangers. These nasty and voracious insects fly out in the evenings, they plunder and corode all kinds of victuals, drest and undrest, and damage all sorts of clothing; every thing made of leather, books, paper, and various other articles. They fly into the flame of candles, and sometimes into the dishes; are very fond of ink and of oil, into which they are apt to fall and perish. In this case they soon turn most offensively putrid, so that a man might as well sit over the putrid body of a large animal as write with the ink in which they have died. They often fly into person's faces or bosoms, and their legs being armed with sharp spines, the pricking excites a sudden horror not easily described. In old houses they swarm by myriads, making every part filthy beyond description where they harbour, which in the day time is in dark corners, behind all sorts of clothes, in trunks, boxes, and in short every place where they can lie concealed. In old timber and deal houses, when the family is retired at night to sleep, this insect, among other disagreeable properties, has the power of making a noise which very much resembles a pretty smart knocking with the knuckle upon wainscotting, in the West Indies it is therefore frequently known by the name of the drummer.

Surinam Bug. (Pl. 55.) This genus is divided into different sections, the whole number of species being above one hundred. The common bed bug has no wings; but the field bugs have all wings, and inhabit plants as various as their shape and colour. The Surinam bug, thus named from Madame Merian, who first discovered this frightful insect at Surinam, and figured it from the life in her inimitable collection, from which our figure is taken, is the largest known species of the cimex tribe, measuring three inches and a half from head to tail, and six inches in its largest extent. It is of a rich brown colour, armed with a single sharp spine on the head, and another at the anus: eyes black and very prominent; two large dark brown spots on the thorax, about the size of peas; two others more oblong behind; and others of various forms and sizes on the fore legs; the elytra are reticuled with white, and are very thick and strong; the interior wings are membranaceous, and of a delicate straw colour. This is not only the largest, but the most destructive and voracious, of the genus, attacking and devouring, in its creeping state, toads, frogs, lizards, aquatic insects, and even fish; and in its winged state, preying upon reptiles, birds, and the larger animals, and even on the weaker individuals of its own family.

Mole Cricket. (Pl. 55.) This little creature, which is a complete representative of the mole, among the insect tribes, is, for an insect, very large, being two inches and a half in length, and three quarters of an inch in breadth. Its fore feet are broad, and strong; and in their formation and position, bear a great resemblance to the fore feet of that animal. They are used for precisely the same purpose as those of moles, to burrow under the surface of the ground, where the insect commonly resides; and so expertly does it use them, that it can penetrate the earth with even greater expedition than the mole.

The female forms a cell of clammy earth, about the size of a hen's egg, closed up on every side, and within as large as two hazel nuts. The eggs, amounting to nearly a hundred and fifty, are white, and about the size of caraway comfits; they are carefully covered, as well to defend them from the injuries of the weather as from the attacks of one of the species of black beetles, which often destroys them. The female places herself near the entrance of the nest, and, whenever the beetle attempts to seize its prey, the guardian insect catches it behind, and bites it asunder.

These insects at the approach of winter, remove their nest to so great a depth in the earth as to have it always lower than the frost can penetrate. When the mild season comes on, they raise it in proportion to the advances of that favourable time, and at last elevate it so near to the surface as to render it susceptible both of air and sunshine; and if the frost return, they again sink it to its proper depth. A method very similar is practised by the ants with their nests.

Common Locust. (Pl. 55.) This insect is about three inches long, and has two horns or feelers, an inch in length. The head and horns are of a brownish colour; it is blue about the mouth, and also on the inside of the larger legs: the shield that covers the back is greenish; the upper side of the body brown, spotted with black, and the under side purple; the upper wings are brown, with small dusky spots, with one larger at the tips; the under wings are more transparent, and of a light brown, tinctured with green, with a dark cloud of spots near the tips.

These noxious insects fly in such numbers, as to seem at a distance like a dark cloud, which, as it approaches, almost excludes the light of day. It often happens that the husbandman sees them pass over without doing him any injury; but in this case they only proceed to settle on some less fortunate country. Wherever they alight, they make dreadful havoc among the vegetation. In the tropical climates their presence is not attended with such destructive consequences as in the southern parts of Europe; for in those, the vegetative power is so strong and active, that an interval of only a few days will sometimes repair all the damage: but in Europe their ravages cannot be obliterated till the succeeding year.

The crested locust differs from the preceding, and is an inhabitant of the East: it is a highly beautiful animal, being of a bright red, with the body annulated with black, and the legs varied with yellow; the upper wings are marked with variegations of dark and pale green; the lower wih transverse undulated streaks. The length of this species from head to tail, is about four inches; and the expanse of wings from tip to tip, when fully extended hardly less than seven inches and a half.

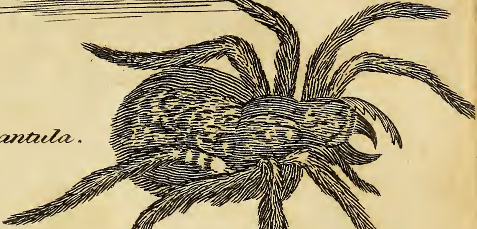
Membranous Locust. (Pl. 55.) This uncouth insect inhabits the deserts of Ural: it is of a pale yellowish colour, with tailed wings; its head inflected and armed with jaws and feelers; hind legs formed for leaping; claws double on all the feet. They reside chiefly under ground, and are six footed, voracious and active, and feed on plants and herbs. Of this tribe of locusts, there are upwards of two hundred species, and are at present used as an article of food by the natives of Africa and India.

House Cricket. This is an inhabitant of almost every house, its wings are tailed and longer than the wing-cases, the body is of a light green colour shaded with brown; and like the preceding, is provided with six feet. It is said to delight in new-built houses; being like the spider, pleased with the moisture of walls; and besides, the softness of the mortar enables them to burrow and mine between the joints of the bricks or stones, and to open communications from one room to another. Yet they are particularly fond of kitchens and baker's ovens, on account of their warmth. Residing as it were in a torrid zone, they are always alive and merry; and a good Christmas fire is to them like the heats of the dog days. Though they are frequently heard by day, yet their natural time of motion is only in the night. As soon as it grows dusk, the chirping increases, and they come running forth, and are from the size of a flea to that of their full stature. As one would suppose them,

Pl. 54.

*Frog.*

*Tarantula.*



Chameleon.

*Stag and Golden Beetle.*

(from the situations which they inhabit,) to be a thirsty race, such they really are, and they shew a great propensity for liquids, being found frequently drowned in pans of water, milk, broth, or the like. Whatever is moist they attack; and therefore often gnaw holes in wet wolen stockings and aprons that are hung to the fire. These crickets are not only very thirsty, but very voracious; for they will eat the scummings of pots, yeast, salt, and crumbs of bread; and any kitchen offal or sweepings. In summer evenings they have been observed to fly out of a window, and over roofs of houses: this feat of activity accounts for the sudden manner in which they often leave their haunts as it does for the method by which they come to houses where they were not known before. It is remarkable that many sorts of insects seem never to use their wings but when they have a mind to shift their quarters and settle new colonies. When in the air, they move in waves or curves like wood-peckers, opening and shutting their wings at every stroke, and so are always rising and sinking. When they increase to a great degree, they become noisy pests, flying into candles, and dashing into people's faces; but may be blasted with gunpowder discharged into their crevices and crannies. Cats catch house-crickets, and playing with them as they do with mice, devour them. Crickets may be destroyed like wasps, by phials half-filled with beer, or any liquid, and set in their haunts; for being always eager to drink, they will crowd in till the bottles are full. A popular prejudice, however, frequently prevents their being driven away and destroyed: the common people imagine that their presence brings a kind of luck to the house while they are in it, and think it would be hazardous to destroy them.

TARANTULA. (Pl. 54.) The breast and belly of the tarantula are of an ash colour—the legs are also of an ash colour, with blackish rings on the under part; the fangs, or nippers, are red on the inner side—the rest being blackish: two of its eyes are larger than the others, red, and placed in the front; four others are placed in a transverse direction, towards the mouth; the other two are nearer the back: it has two antennæ, or feelers. It is a native of Italy, Cyprus, Barbary, and the East Indies. It lives in bare fields, where the lands are fallow, but not very hard; and, from its antipathy to damp and shade, chooses for its residence, the rising part of the ground facing the east. Its dwelling is about four inches deep, and half an inch wide; at the bottom it is curved, and there the insect sits in wet weather, and cuts its way out if water gains upon it—It weaves a net at the mouth of the hole. These spiders do not live quite a year. In July they shed their skin, and proceed to propagation; which, from a mutual distrust, as they frequently devour one another, is a work undertaken with great circumspection. They lay about 730 eggs, which are hatched in the spring; but the parent does not live to see her progeny, as she expires early in the winter. The ichneumon fly is their most formidable enemy. The bite of the tarantula is said to occasion an inflammation in the part, which in a few hours brings on sickness, difficulty of breathing, and universal faintness. The person is afterwards affected with a delirium, and generally seized with a deep melancholy. The same symptoms return annually, in some cases for several years, and at length terminate in death. Music, it has been pretended, is the only cure. A musician is brought, who tries a variety of airs, till at last he hits upon one which excites the patient to dance; the violence of which exercise produces a proportionable agitation of the vital spirits, attended with a consequent degree of perspiration, the certain consequences of which is a cure. Such are the circumstances which have generally been related, and long credited, concerning the bite of this animal. But, doubts of the truth of these circumstances have originated in some very respectable authorities. There is a letter recorded in the Philosophical Transactions for 1762, page 406, from Dr. Thomas Cornelio, a Neapolitan physician, to John Doddington, Esq., his Britannic Majesty's resident at Venice, containing the following relation.—"Meanwhile I shall not omit to impart to you, what was related to me a few days since, by a judicious and unprejudiced person—'being in the county of Otranto, where those insects are in great numbers, there was a man, who thinking himself bitten by a tarantula, shewed in his neck a small speck, about which, in a very short time, there arose some pimples full of a serous humour; and that, in a few hours after, the poor man was sorely afflicted with violent symptoms, as syncopies, very great agitations, giddiness of the head, and vomiting; but that without any inclination at all to dance, and without any desire of having any musical instruments, he miserably died within two days." Various opinions, however, are entertained on the subject, and many sensible people, differ with the doctor, and affirm, that music has the power, to counteract the effects of the poison of the tarantula.

GREAT AMERICAN SPIDER. (Pl. 55.) This is one of the largest species of the tribe. Its back is covered with a hard, thick brown coat, hollowed at the sides, and cleft transversely across the middle, as if it had a hole in that place. The head is small and with difficulty distinguished from the corselet. The mouth is furnished with brown, hard, crooked teeth: the body is large and round, growing out into two parts. The whole body, except the back, and the feet, are covered with long bushy hair; an exact representation of which is delineated in the engraving, which shows the under part of the same spider. The extremeties of the feet are smooth and large, like the toes of a dog.

This hideous species of the spider tribe, preys principally on small birds; in doing of which, it tears them to pieces in a cruel manner to get at their blood, and afterwards sucks their eggs.

BARBARY SPIDER. This species is as large as a man's thumb, and is a native of Barbary. It inhabits hedges and thickets: its webs have large meshes, and it resides in the centre upon its nest. The snares are spread for large flies, wasps, drones, and even locusts. The animal which it entangles is soon killed by the spider, and partly eaten if the spider be hungry; the rest is concealed under some neighbouring dry leaves, covered with a kind of web, and a blackish glue in great abundance. Its larder is often plentifully stored. Its nest is about the size of a pullet's egg, divided horizontally, and suspended by the threads of the insect, which are of a silvery white, and stronger than silk. It carries its eggs in a little bag under its belly, from which the young ones come out, and for a time live in the same web in amity; but, when grown up, are mortal enemies. Whenever they meet they fight with violence; their battle only ends with the death of the weakest; whose dead body is carefully stored away in the larder.

COMMON SPIDER. (Pl. 55.) There are several species of this insect, but every kind has two divisions in its body. The fore part containing the head and breast, is separated from the hinder part, or belly, by a very slender thread, through which, however, there is a communication from one part to the other. The fore part is covered with a hard shell, as well as the legs, which adhere to the breast; the hinder part is clothed with a supple skin, beset all over with hair. They have several eyes all round the head, brilliant and acute; these are sometimes eight in number, sometimes but six; two behind, two before, and the rest on each side. Like all other insects, their eyes are immoveable, and they want eye-lids, but this organ is fortified with a transparent horny substance, which at once secures and assists their vision. As the animal procures its subsistence by the most watchful attention, so large a number of eyes is necessary to give it the earliest information of the capture of its prey. They have all eight legs, jointed like those of lobsters, and similar also in other respects. But its principal qualification is making its web, by which means its existence entirely depends.

The females lay six or seven hundred eggs in bags, which they make on purpose, lined within side by a down which they pluck from their own breast. These eggs, are generally deposited in August or September, and about sixteen days afterwards the young are hatched.

SCORPION. (Pl. 55.) The scorpion has a distant resemblance in shape to the lobster, but is infinitely more ugly: it also casts its skin as the lobster does its shell. They have eight legs, besides two claws and eight eyes, spring. As they afterwards increase in size, they spread abroad in search of food; but their local attachment is very remarkable, for neither the caterpillar nor even the butterfly will stray from the place where it was bred. Numbers of the latter may sometimes be observed on wing, in a small spot of swampy or marsh land, when not one of them is to be met with in any of the adjacent places. As they fly very low, and frequently settle, they are easily caught. The caterpillars are generally at their full growth about the last week in April; when it takes place, they suspend themselves by the tail to change into chrysalids, in which state they remain fourteen days.—Their mode of suspension, is a singular instance of the extraordinary power of instinct. They first draw two or three blades of grass across towards their top, and fasten them together by means of their silk: then hang themselves beneath the centre of these, each having its own little canopy. By this means, they are not only hidden from the sight of birds, but defended in a great measure from the damage they might otherwise sustain from windy and boisterous weather. They feed on the devil's-bit scabious, and on various kinds of marsh grasses; eating only the opening leaves as they come up, which renders them sometimes difficult to find. This they do only while the sun shines; for if, in the very act, the sun becomes hidden behind a cloud, they immediately cease; but, on the return of the sun-beams, they recommence their operations with great voracity.

PAINTED-LADY BUTTERFLY. (Pl. 56.) The butterfly may be said to consist of three parts; the head, the corselet, and the body. The body is the hinder part, and is composed of rings, which are generally concealed under long hairs with which that part of the animal is clothed. The corselet is more solid than the rest of the body, and in which the fore-wings, and the legs are fixed. They have six legs, but make use of only four; the two fore feet are covered by the long hairs of the body, and are sometimes so much concealed, that it is difficult to discover them. The eyes of butterflies have not all the same form; in some they are the larger portion of a sphere: in others they are but a small part of it, and just appearing from the head: in some also they are small, and in others large; but in all of them, the outer coat has a lustre, in which may be discovered all the various colours in the rainbow. It has, likewise, the appearance of a multiplying-glass, having a great number of sides, or facets, in the manner of a brilliant cut diamond. In this particular, the eye of the butterfly and of most other insects correspond.

The wings of butterflies are very different to those of any other fly: they have four in number, and though two of them be cut off, the animal is still enabled to fly. They are, in their own substance, transparent, but owe their opacity to the beautiful dust with which they are covered.

The painted lady butterfly is a species not very common. In some seasons, these insects appear in considerable numbers, and then again are not seen for several years. In point of beauty, this has the highest claim of all; its wings are indented, above orange, variegated with black and white beneath; four eyes on the posterior pair. Its larva feeds on nettles, thistles, docks, and other herbage; by the sides of ditches, and changes its state about the middle or latter end of July.

SPHINK CAROLINA. (Pl. 56.) The larva of this scarce insect is green, with lateral spiricles on every segment, surrounded by a purple ring, and the caudal spine is of the same colour. When full grown, they are thick set in the middle; their horn or tongue is generally curled; aad they have two feelers. Their wings clouded, entire, and posterior margin dotted with white; abdomen has five pair of sulvous spots.

In the southern states they are distinguished by the name of tobacco-moths, on account of their feeding entirely on that plant.

ELM MOTH. (Pl. 56.) The wings of this insect are white, with a double row of pale black spots across the middle: a furruginous brown spot at the base, and another at the posterior margin of the first pair: like-

The Heckman Bindery, Inc.
N. Manchester, Ind.
JAN 1961
"Bound To Please"